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SECTOR 8

THE NETHERLANDS AND GERMANY—TERSCHELLING TO THE RIVER JADE AND THE RIVER WESER

Plan.—This sector describes the Netherlands and German coasts, including the off-lying islands and the River Ems, between Terschelling and the estuary of the River Jade and the River Weser. The descriptive sequence is from W to E and then N to S in the rivers.

General Remarks

8.1 The coastal area between Terschelling and the estuary of the River Jade and the River Weser is fronted by the Frisian Islands, a fairly low chain of detached islets and islands. The group which lie off the Netherlands coast are known as the West Friese Eilanden group while those lying off the German coast are known as the Ostfriesiche Inseln group.

Between this chain and the mainland, the waters are shallow and mostly consist of drying flats. The only maritime activity of any significance is centered on the River Ems, which contains the Netherlands port of Delfzijl and the German port of Emden. The small German port of Norderney, located on the island of the same name, may be approached through the Norderney Seegat, which leads between the islands of Juist and Norderney.

Terschelling, Ameland, and Schiermonnikoog, the larger islands of the West Friese Eilanden, have sandy beaches backed by dunes. The smaller islands are generally very low.

The Ostfriesiche Inseln group consists of Borkum, Juist, Norderney, Baltrum, Langeoog, Spiekeroog, and Wangerooge. These islands also have sandy beaches backed by dunes. In general, the elevations on each of these islands becomes progressively lower from the W to E. Small villages and vacation resorts, with hotels, are situated on all of these islands.

Numerous wrecks, some marked by buoys, lie seaward of the chain and in the approaches to the River Jade and the River Weser.

The estuary through which the River Jade and the River Weser reach the sea is located between the islands of Wangerooge and Scharhorn. The River Jade, a fairly deep and wide river, leads to the port of Wilhelmshaven, 23 miles above the entrance. The River Weser, one of the most important Ger-man rivers, leads to the ports of Bremerhaven, Nordenham, Brake, and Bremen. In addition, this river provides access to the extensive inland waterway system of Germany.

Tides—Currents.—The tidal current setting NE from the S part of the North Sea and the tidal current setting WSW or SW from the German Bight (Deutsche Bucht) meet in the offing, abreast of Texel, where they both join and set NW towards the middle of the North Sea. In the opposite situation, the tidal current setting SE from the North Sea splits into two branches in about the same place; one branch sets SW towards the S part of the North Sea and the other sets NE or NNE towards the German Bight.

Off the off-lying chain of islands and islets, the tidal current is rectilinear and sets with the trend of the coast. An E current is associated more with a rising tide and a W current is associated more with a falling tide. As the coast is approached, the tidal currents are more and more affected by the local tidal currents which flow in and out of the numerous channels within the chain.

In a position about 10 miles NW of the entrance to the Zeegat van Terschelling, the E current begins to set 4 hours 45 minutes after HW at Helgoland and the W current begins to set 1 hour 30 minutes before HW; both currents may attain a rate of 1.8 knots at springs.

In a position about 15 miles N of the entrance to the Friesche Zeegat, the E current begins to set 6 hours after HW at Helgoland and the W current begins to set at HW; at springs, the E current may attain a rate of 1.5 knots and the W current a rate of 1.2 knots.

Pilotage.—For rules and regulations concerning the pilotage of large vessels (including tankers and bulk carriers) navigating in the German Bight (Inner Deutsche Bucht) and proceeding to the River Ems, the River Jade, the River Weser, or the River Elbe, see Pilotage under Approach Routes to the German Bight (paragraph 8.3).

For pilotage rules and procedures concerning all other vessels navigating in the German Bight and proceeding to the the River Ems, the River Jade, the River Weser, or the River Elbe, see Pilotage under the description of each individual estuary.

Regulations.—Below are extracts from the Traffic Regulations applying to all German waterways which are of particular significance to the waters described in this sector.

Extraordinary Large Vessels are those exceeding the normal maximum dimensions (length, beam, and draft) which have been announced for entry into a waterway. Such vessels require a special permit from the local authorities prior to entering. For more information, see Regulations under the description of each river.

The starboard side of the fairway is that which is on the starboard side of a vessel when entering from seaward. Where a fairway connects two parts of the sea or two bodies of water separated from one another by shallows, the starboard side of the fairway is deemed to be on that side of the fairway which a vessel arriving from the W (any direction from S to N through W) passes on its starboard side. Where doubt may exist, due to the tortuous nature of a channel, the northernmost entrance into such a fairway is to be used as the means for determining the starboard side of the fairway.

Generally, vessels should navigate on the right side of the fairways. In specified places within the waterways, certain vessels, with permission, are authorized to navigate on the left side. Overtaking is normally carried out on the left side.

Caution.—Numerous gas and oil installations are situated both on the surface and on the seabed in the waters through which the main routes lead to the German Bight.

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Approach Routes to the German Bight

8.2 The Deep-Water Routes and Traffic Separation Schemes (TSS) described below are all IMO-adopted and Rule 10 of the International Regulations for Preventing Collisions at Sea (1972) applies. They may best be seen on the graphics in paragraph 6.1 and in detail on the charts of the area.

A Deep-Water Route, the limits of which are shown on the chart, leads N from the vicinity of the Noord Hinder Junction Precautionary Area (51˚57'N., 2˚38'E.) and separates into E and W branches.

The W branch leads N to DR1 Lighted Buoy (53˚04'N., 2˚40'E.) then, in conjunction with the Off Botney Ground TSS, NE and ENE to the W end of the Freisland Junction Precautionary Area; the least depth in this branch was reported to be 27m (1998).

Undefined routes, used occasionally by deep-draft vessels bound for the Dover Strait from the Shetland Islands or Scandinavia, join the W branch in the vicinity of the Off Botney Ground TSS.

The E branch, in conjunction with the Off Brown Ridge TSS and the West Freisland TSS, leads NNE and NE to the S side of the Freisland Junction Precautionary Area; the least depth in this branch was reported to be 23m (1995).

The Deep-Water Route then continues E from the E end of the Freisland Junction Precautionary Area and, in conjunction with the East Freisland TSS and the German Bight Western Approach TSS, leads into the Jade and Weser approaches.

GB Lightfloat (54˚11'N., 7˚26'E.), equipped with a racon, is moored close E of the inner end of the German Bight Western Approach TSS.

GW/Ems Lightfloat (54˚10'N., 6˚21'E.), equipped with a racon, is moored within the TSS. It marks a N/S linking route which crosses the separation schemes and leads via GW/TG Lighted Buoy (53˚59'N., 6˚22'E.) and Borkumriff Lighted Buoy (53˚47'N., 6˚22'E.), equipped with a racon, to the entrance of the River Ems.

The Off Texel TSS extends NNE for 21 miles from a position about 30 miles NW of IJmuiden to VL South Lighted Buoy (53˚09'N., 4˚26'E.).

The Off Vlieland TSS extends 20 miles NNE from VL South Lighted Buoy to VL Center Lanby (53˚27'N., 4˚40'E.), which is equipped with a racon. It then leads 18 miles ENE to the junction with the Off Tershelling-German Bight TSS at TE1 Lighted Buoy and TE2 Lighted Buoy (53˚37'N., 5˚07'E.).

The Vlieland North TSS extends NNE for 9 miles from the VL Center Lanby. Vlieland Junction, a precautionary area, has been established where the northnortheastbound traffic lane of the Vlieland North TSS crosses the westsouthwestbound traffic lane of the Off Vlieland TSS.

The Off Terschelling-German Bight TSS extends ENE for about 90 miles from the E end of the Off Vlieland TSS to Jade/Weser Lighted Buoy (53˚58'N., 7˚37'E.), which is equipped with a racon. Borkumriff Lighted Buoy (53˚47'N., 6˚22'E.), equipped with a racon, is moored midway along this TSS.

The Jade Approach TSS extends SE from GB Lightfloat (54˚11'N., 7˚26'E.) to the E end of the Off Terschelling-German Bight TSS.

An Inshore Traffic Zone lies between the SE and S limits of the Off Vlieland TSS and Off Terschelling-German Bight TSS and the adjacent coasts.

An approach TSS is situated in the vicinity of Elbe Lighted Buoy (54˚00'N., 8˚07'E.). Inbound vessels for the River Elbe should pass to the S of Elbe Lighted Buoy; outbound vessels should pass to the N of it.

Caution.—It is reported (2002) that buoyage within the Off Terschelling TSS, the Off Vlieland TSS, and the Off Brown Ridge TSS is to be changed and renumbered during 2003.

Pilotage

8.3 A central pilot transfer service provides pilots in the approaches to the German Bight. This service, which is available to all vessels on request, is compulsory for the following vessels:

1. Petroleum, gas, and chemical tankers with a length greater than 150m, or a beam greater than 23m, enroute to or from the River Ems, the River Jade, the River Weser, or the River Elbe, including unloaded tankers if not cleaned, degassed, or inerted after having carried petroleum or petroleum products with a flashpoint below 35 C.
2. Bulk carriers, other than oil, gas, or chemical tankers, with a length greater than 220m or a beam greater than 32m enroute to or from the River Elbe.
3. Bulk carriers, other than oil, gas, or chemical tankers, with a length greater than 250m, a beam greater than 40m, or a draft greater than 13.5m enroute to or from the the River Weser or River Jade.
4. Other vessels with a length greater than 350m, or a beam greater than 45m, enroute to or from the River Jade, the River Weser, or the River Elbe.

Pilots board the above vessels, as follows:

1. Vessels bound to and from the River Ems in the vicinity of GW-TG Lighted Buoy (53˚ 59'N., 6˚ 21'E.).
2. Vessels inbound to the River Jade and the River Weser in the Jade Approach TSS about 1 mile SE of GW11/Jade Lighted Buoy (54˚ 08'N., 7˚ 27'E.).
3. Vessels outbound from the River Jade and the River Weser in the Jade Approach TSS about 3 miles ENE of TG18/Jade Lighted Buoy (54˚ 02'N., 7˚ 33'E.).
4. Vessels bound to and from the River Elbe about 2 miles WNW of E3 Lighted Buoy (54˚ 04'N., 7˚ 55'E.)

Such large vessels should send a request for pilotage and an ETA, at the appropriate boarding place, at least 24 hours in advance. The message must include the following:

Designator	Information Required
A	Vessel name and call sign.
U	Length, beam, and grt.
H	ETA at pilot boarding position.
O	Draft (in decimeters)
I	Port of destination.
X	Indication (and location) whether an approved helicopter landing area or marked winching area is available.

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Confirmation or correction reports must be sent to the pilot station for the River Elbe 6 hours and 2 hours prior to arrival.

Confirmation or correction reports must be sent to the appropriate pilot station for the River Ems, the River Jade, or the River Weser 6 hours and 3 hours prior to arrival.

Vessels bound for the River Ems should send their request for pilotage to Ems Pilot, Emden; vessels bound for the River Jade or the River Weser should send their request for pilotage to Weser Pilot, Bremerhaven; and vessels bound for the River Elbe should sent their request for pilotage to Elbe Pilot, Brunsbuttel.

Tankers over 300m in length or 16.5m draft approaching the German Bight must embark two pilots beyond the boarding positions within the Jade Approach TSS.

Pilots are normally embarked from pilot vessels. In exceptional cases, pilots may transfer by helicopter. This service can only be performed if a designated area on the vessel, which complies with all regulations, is available for landing or winching. Such helicopter transfers can be carried out at wind speeds up to 55 knots (force 10) relative to the vessel.

In the case of transfers from a helicopter from Helgoland (Helgoland Pilot), a continuous VHF listening watch should be kept on channel 16 for 30 minutes prior to arrival. After radio contact has been established, the helicopter should be informed of the vessel's position, course and speed, the relative wind force and direction over the winching or landing area, the air temperature, the visibility, any roll and pitch, and the condition of the deck (whether wet or dry, etc.).

The German authorities have pointed out that, during the transfer operation, vessels are restricted in their ability to maneuver and may exhibit the lights and shapes prescribed in Rule 27 of the International Regulations for Preventing Collisions at Sea.

For pilotage information concerning vessels not included in these instructions and regulations, see the Pilotage section listed under the description of each river.

Regulations

8.4 The E branch of the Deep Water Route is recommended by the IMO as a two-way route for the following:

1. Tankers of 10,000 grt and over transporting oils listed in Annex I of Marpol 73/78.
2. Vessels of 5,000 grt and over transporting noxious liquid substances in bulk listed as Categories A or B in Annex II of Marpol 73/78.
3. Vessels of 10,000 grt and over transporting noxious liquid substances in bulk listed as Categories C or D in Annex II of Marpol 73/78.
4. Vessels of 10,000 grt and over transporting liquified gases in bulk.

The IMO recommends that the Off Brown Ridge TSS, the West Freisland TSS, and the German Bight Western Approach TSS should be used by these vessels in continuation with the two-way route.

The IMO recommends that the above vessels should not use the Texel TSS, the Off Vlieland TSS, nor the Off Terschelling-German Bight TSS.

In addition, such vessels should avoid the sea area lying between the mandatory route and the Frisian Islands, except when joining or leaving the route at the nearest point to the port of destination.

The above vessels must use the mandatory route, or part of it, under the following circumstances:

1. When sailing from Noord Hinder (51˚57'N., 2˚53'E.) to the Baltic Sea or to North Sea ports in Norway, Sweden, Denmark, Germany, or the Netherlands N of latitude 53˚N.
2. When sailing between North Sea ports in the Netherlands and/or Germany.
3. When sailing between the United Kingdom or Continental North Sea ports S of latitude 53˚N and ports in Scandinavia or the Baltic Sea.
4. When sailing between Noord Hinder, the United Kingdom, or Continental North Sea ports S of latitude 53˚N and oil loading facilities (offshore or shore-based) in the North Sea area. However, this does not apply to vessels sailing between ports on the E coast of the United Kingdom, including the Orkney Islands and the Shetland Islands.

Vessels which cannot safely navigate the mandatory route because of their draft are exempted from the requirement to use the S part of it. Such vessels are strongly recommended to use the W branch of the Deep Water Route and proceed via DR1 Lighted Buoy and the Off Botney Ground TSS.

Sailing vessels and small craft under 20m in length should use the Inshore Traffic Zone. Other vessels may use this zone when bound to or from a port, offshore installation, pilot station, or when seeking shelter.

Germany has promulgated regulations pertaining to vessels navigating in an area extension to its territorial sea located within the German Bight (Deutsche Bucht). This area extension lies in the vicinity of the Jade Approach TSS and may best be seen on the chart.

Deep-draft vessels constrained by the tide in the waterways into which they are proceeding are deemed to be right-of-way vessels when navigating inbound on the routes leading between GB Lightfloat (54˚11'N., 7˚26'E.), or the deep water anchorage located close S of the lightfloat, and the River Jade, the River Weser, or the River Elbe.

In this case, a right-of-way vessel is defined as “a vessel restricted in its ability to maneuver” as per Rule 3(g) of the International Regulations for Preventing Collisions at Sea (1972). Such vessels should display the appropriate lights and signals as per Rule 27(b).

In practice, this regulation applies especially to vessels proceeding E within the Off Terschelling-German Bight TSS. Such vessels must not in any way impede those large ships, especially tankers, which are heading from the German Bight Western Approach TSS towards the entrances to the River Jade, the River Weser, or the River Elbe.

Traffic Control

8.5 A Vessel Traffic Service (VTS) system operates in the approaches to the German Bight (Inner Deutsche Bucht). Participation in this VTS system is mandatory for the following:

1. Vessels over 50m in length, including pushed or towed composite units.
2. Vessels carrying dangerous goods (gas, chemicals, petroleum, or petroleum products) in bulk.
3. Nuclear-powered vessels.

Vessels entering the VTS area must maintain a continuous listening watch on VHF channel 80 (in the E part of the VTS), on VHF channel 79 (in the W part of the VTS), or on VHF channel 16.

A Sailing Plan (SP) must be sent before entering the VTS area or before leaving a berth within the VTS area. The SP must contain the following information:

Designator	Information Required
A	Vessel name and call sign.
D	Position.
U	Length (in meters), beam (in decimeters), and type.
O	Draft (in decimeters).
G	Port of departure.
I	Port of destination.
P	Indication if liquefied gases, chemicals, petroleum, or petroleum products are or were carried in bulk. If yes, type, quantity, and UN number and whether tanks are uncleaned or completely inerted.
Q	Deficiencies or restrictions on maneuverability.
T	Name of vessel's owner or agents.

An SP must be sent to the VTS Center German Bight Traffic on VHF channel 79 or 80, as follows:

1. On passing GW7 Lighted Buoy—Vessels approaching the German Bight through the German Bight Western Approach TSS.
2. On passing TG13 Lighted Buoy—Vessels approaching the German Bight through the Terschelling-German Bight TSS.
3. Upon crossing latitude 54˚ 20'N—Vessels approaching the German Bight from the N.
4. Upon crossing the longitude of GW7 Lighted Buoy (6˚ 54'E.)—Vessels approaching the German Bight from the W.
5. Before leaving a port within the VTS area.

A Position Report (PR) must be sent when passing certain reporting points in the VTS area. The PR must contain the following information:

Designator	Information Required
A	Vessel name and call sign.
B	Time of report (local time in 4 digits).
D	Position.
F	Speed.

A PR must be sent to VTS Center German Bight Traffic on VHF channel 80, as follows:

1. On passing GW9 Lighted Buoy.
2. On passing TG17/Weser 1 Lighted Buoy.
3. On passing No. 4a (Neue Weser) Lighted Buoy for vessels leaving the Neue Weser.
4. On passing No. A2 (Alte Weser) Lighted Buoy for vessels leaving the Alte Weser.
5. On passing Elbe Lighted Buoy (54˚ 00'N.,8˚ 06'E.)for vessels leaving the River Elbe.

Incident Reports (IR) and Deviation Reports (DR) must be sent to the VTS Center German Bight Traffic as necessary.

Radar assistance is provided on request or by order of the VTS Center on VHF channel 80 for vessels under mandatory pilotage between the Inner Deutsche Bucht (German Bight) pilot boarding position (2 miles NW of E3 Lighted Buoy) and Jade 2 Lighted Buoy (53˚ 52'N.,7˚ 47'E.)when visibility is less than 2,000m. The request should be made to German Bight Traffic on VHF channel 80, stating the vessel name, call sign, and position. The information is given in German or, on request, in English.

Information broadcasts are given every hour on the hour, in German and English, on VHF channel 80, concerning details relevant to the safe passage through the VTS area. These broadcasts include general fairway and traffic situation information.

For information concerning local VTS systems within the River Ems, the River Jade, the River Weser, and the River Elbe, see Regulations-Traffic Control under the description of each river.

Off-lying Dangers

8.6 Numerous production platforms, wells, and gas and oil pipelines lie in the waters within the approaches to Terschelling and the German Bight, and may best be seen on the charts. Extreme caution is advised when navigating in the vicinity of such facilities. Some of the production platforms are equipped with racons.

The principal oil and gas fields in the area are listed below:

1. Nam Gas Field (53˚30'N., 3˚22'E.).
2. Noordwinning Gas Field (53˚15'N., 3˚10'E.).
3. Placid Gas Field (53˚26'N., 4˚14'E.).
4. Petroland Gas Field (53˚35'N., 4˚12'E.).
5. Wintershall Gas Field (53˚35'N., 4˚28'E.).
6. Mobil Field (52˚45'N., 3˚45'E.).
7. Helder Oil Field (52˚56'N., 4˚09'E.).
8. Helm Oil Field (52˚52'N., 4˚08'E.).
9. Sean Gas Field (53˚11'N., 2˚52'E.).
10. Orwell Gas Field (53˚08'N., 3˚02'E.).
11. Davy Field (53˚00'N., 2˚55'E.).
12. Welland Gas Field (53˚00'N., 2˚45'E.).
13. Yare Gas Field (53˚02'N., 2˚35'E.).
14. Thames Gas Field (53˚05'N., 2˚32'E.).
15. Indefatigable Gas Field (E part) (53˚17'N., 2˚35'E.).
16. Markham Gas Field (53˚52'N., 2˚55'E.).

For locations of oil and gas fields lying N and W of the above fields, see paragraph 9.1 and paragraph 3.1, respectively.

Numerous wrecks, some swept, lie in the vicinity of the approaches to the German Bight and may best be seen on the chart. Generally, wrecks with shallow depths are marked by buoys.

A complex of towers connected by submarine cables is situated within 15 miles of a central tower (53˚44'N., 2˚33'E.), which stands about 40 miles N of DR1 Lighted Buoy.

A firing exercise area, used by aircraft, is located between the East Freisland TSS and the Off Terschelling-German Bight TSS.

Terschelling to the Ems Estuary

8.7 Terschelling (53˚22'N., 5˚10'E.) is the longest island of the West Friese Eilanden group. Its W and E ends are formed by large sand flats which, during stormy weather, are mostly submerged. In the central part of the island, there are sand dunes which mostly stand 9 to 12m high, but a few attain heights up to 24m.

Several wrecks, some dangerous, lie on the coastal bank in this vicinity and may best be seen on the chart.

The village of West Terschelling, with a small harbor, stands on the E side of the SW part of the island. A main light (Terschelling) is shown from Brandaris Tower, which stands in the village (see paragraph 7.25).

The islands of Terschelling, Ameland, and Schiermonnikoog lie off this section of coast. The distance between the W end of Terschelling and the E end of Schiermonnikoog is about 45 miles.

Between these islands, navigable passages lead to the inner waters. Zeegat van Ameland passes between Terschelling and Ameland, and Friesche Zeegat passes between Ameland and Schiermonnikoog. However, most of the inner waters are not navigable, even by small vessels.

Terschellinger Wad is the area of water lying between Terschelling and the coast. Other areas include Friesche Wad, which lies between Ameland and the mainland, and Groninger Wad, which lies between Schiermonnikoog and the coast.

Friesland is the mainland province fronted by Terschelling and Ameland; Groningen, the adjoining province, is fronted in part by Schiermonnikoog. Lauwerszee, the only place of any significance in the inner waters, is a bight which lies between Friesland and Groningen. It is accessible from the sea through Friesche Zeegat. The sluice harbors of Zoutkamp and Nieuwezijlen, which are sea outlets for the inland canals, are located within this bight.

Several villages are situated on Ameland, and one village is situated on Schiermonnikoog.

Numerous wrecks, some of which are stranded, lie in the vicinity of this section of the coastal bank and may best be seen on the chart. Several wrecks, some swept, lie to seaward of the coastal bank and up to 20 miles offshore. Depths in the zeegats and in the inner waters are shallow.

Winds—Weather.—Ice appears along this coast almost every year. During mild winters, there may be only several days with ice on the mainland coast and none along the shores of the islands. During a very severe winter, ice may be recorded for over 80 days on the N sides of the islands, for over 90 days on the S sides of the islands, and for up to 100 days in Lauwerszee; navigation in the inner waters has been reported closed for 50 to 80 days.

Ice generally makes its first appearance in the middle of December and remains until the latter part of March.

Tides—Currents.—The tide on the seaward sides of the islands rises 2.4 to 2.6m at springs and 1.8 to 2.3m at neaps.

As the coast is approached, the tidal currents are more and more affected by the currents setting into and out of the zeegats and the Ems.

8.8 Zeegat van Ameland (53˚28'N., 5˚35'E.), lying between Terschelling and Ameland, is of little importance to commercial vessels and provides no safe anchorage in bad weather; shoals and drying banks extend up to 3.3 miles offshore from the two islands. In addition, Bornrif, a steep-to drying bank, extends up to 4.7 miles NW from the W end of Ameland. Kofmansbult, a shallow bank, lies close W of Bornrif. Westgat, the principal entrance channel, is approached from the W and leads between Kofmansbult and the Terschelling coast into Borndiep; the bar, which fronts the entrance to this channel, has a least depth of 3.7m. Akkepollegat, another shallow channel, leads between Bornrif and Kofmansbult, but is not used.

Borndiep, a deep channel, passes between Terschelling and Ameland and is marked by buoys. Shallow branch channels lead into Terschellinger Wad and Friesche Wad from its inner end.

Friesche Wad consists mostly of drying flats with several intersecting small channels. It is only at HW that navigation by small craft is possible. Buoyed channels branch off from Borndiep and lead to Nes, on the S side of Ameland, and Holwerd, on the Friesland coast. Two other buoyed channels branch off from Borndiep and lead to Harlingen; one channel favors the Terschelling coast and the other favors the coast of Friesland.

Ameland (53˚27'N., 5˚47'E.) is bordered at its W end by dunes which continue along the N coast to within 1.5 miles of its E end, which is very low.

A main light is shown from a conspicuous tower, 55m high, standing near the W end of this island. Nesserduin, the highest of the dunes, stands 3.5 miles ENE of the light and has a conspicuous white patch on its E side. Prominent marks include church towers standing at Hollum and Nes, a bathing pavilion situated close N of Nes, and a beacon standing 1.8 miles W of the E end of the island.

Ameland Light

Schiermonnikoog Light

8.9 **Friesche Zeegat** (53˚28'N., 6˚04'E.), leading between Ameland and Schiermonnikoog, provides access to the Lauwerszee and the waters lying between the two islands and the mainland. These waters can only be entered during fine weather when the surf is not breaking on the banks at the entrance. Local knowledge is essential for entering; however, no pilots are available and the channel is only used by local fishing boats and small coasters.

Engelsmanplaat (53˚27'N., 6˚03'E.), lying abreast the E end of Ameland, is a bank of sand which does not quite cover at HW. A lighted beacon and a refuge hut stand near the N end of this bank.

Friesche Zeegat is obstructed by drying patches and shoal banks, with hard sandy bottoms, which lie between Ameland and Schiemonnikoog. Some of these banks extend up to 3.5 miles offshore. Rif, steep-to with a least depth of 0.9m, is the outermost bank in the zeegat.

Westgat, the only usable entrance channel leading into the zeegat, is marked by a fairway lighted buoy, which is moored about 3 miles N of Schiermonnikoog Light. This channel leads S into Zoutkamperlaag and is marked by buoys, but is subject to continuous changes. The fairway is reported (1999) to have a least depth of 3.2m.

Zoutkamperlaag (53˚23'N., 6˚10'E.), which is marked by buoys, is a continuation of the main channel of the zeegat. Smaller channels, marked with buoys and perches, branch off from Zoutkamperlaag and lead S into Lauwerszee, W into the Friesche Wad, towards the Ameland Dam, and E into Gronginger Wad. At HW, small craft can reach the ferry stage at Oosterburen through one of these channels.

The coasts of Friesland, Groningen, and part of the SW side of Schiermonnikoog are protected by dikes. Several towers stand on the mainland coasts and are prominent; lights are shown at Oostmahorn and Zoutkamp.

Lauwerszee (53˚23'N., 6˚10'E.), which is roughly 5 miles in extent, dries over its greater part. This bight is enclosed by a dam and access is obtained through a lock situated at the harbor of Oort, 4 miles SE of the SW end of Schiermonnikoog; however, only small vessels can be handled.

Schiermonnikoog (53˚30'N., 6˚15'E.), an island located 5.5 miles E of Ameland, has sand dunes standing on its W and N sides.

A main light is shown from a prominent tower, 43m high, standing at the W end of the island. A water tower, formerly a light tower and similar in appearance to the one presently in use, and a large resort hotel stand in the vicinity of the light. The E part of the island is formed by a sandbank on which stands a beacon with a diamond topmark.

The village of Oosterburen, with a small tower, stands on the SW end of the island. A landing stage is situated here for the ferry boat which runs to Oostmahorn.

Caution.—Several platforms and submarine pipelines are situated in the vicinity of the approaches to Frieshe Zeegat and may best be seen on the chart.

The Ems Estuary

8.10 The **River Ems** (53˚36'N., 6˚21'E.), the westernmost of the German rivers, discharges into the sea through a wide estuary which lies between the island of Schiermonnikoog, on the W side, and the island of Juist, 21.5 miles ENE.

The estuary is fronted by extensive shoal banks which extend up to about 6 miles seaward from the outer islands. Its outer part is divided into the Westerems and the Osterems by the German island of Borkum and Randzel, a large drying flat.

The principal entrance channels lie within the Westerems and consist of Hubertgat Channel and Westerems Channel.

The channels from both sides of the estuary meet and enter the river proper between the Netherlands coast of Groningen and the German coast of Ostgriesland. Der Dollard, a large drying bay, lies in the Ems, 21 miles SE of Borkum. The river above Der Dollard narrows to a width of less than 0.5 mile.

The Netherlands ports of Eemshaven and Delfzijl are located on the Groningen coast and the German port of Emden is located on the Ostfriesland coast, at the N side of Der Dollatd. Both ports are connected to the extensive inland waterway system. In addition, the small German ports of Leer and Papenburg are located in the narrow part of the river, 16 and 22 miles, respectively, above Emden.

The boundary between Germany and the Netherlands lies close SW of Borkum and in the SE part of Der Dollard.

Borkum Riffgrund (53˚53'N., 6˚15'E.), an extensive bank with depths of 18 to 36m, lies between 8 and 45 miles NW of Borkum. This bank is not to be confused with Borkumriff, the shorebank which fronts the NW side of Borkum and separates the channels of the Westerems from the Osterems. Borkum Riffgrund can be distinguished from the inshore banks by the nature of its bottom which consists of very coarse pebbly sand, spreckles, gravel, and shells. Soundings on this bank are very useful in ascertaining the position of a vessel.

Westerems Channel, the main approach into the estuary, lies between Borkumriff and the easternmost islands of the West Friese Eilanden group. Above the confluence of the Westerems Channel and Hubertgat Channel, off the W side of Borkum, the main fairway in the estuary leads SE through the channels of Randzelgat and Dukegat into Ostfriesisches Gatje and then to the ports of Delfzijl and Emden.

Alte Ems, lying nearly parallel to and SW of Randzelgat, and Emshorn Fahrwasser, lying nearly parallel to and NE of

Dukegat, are deep secondary channels which lead towards Ostfriesisches Gatje.

The outer end of the extensive drying flats, which front the Groningen coast, lies between the E end of Schiermonnikoog and a position 2.5 miles SW of Borkum. On this outer end are the sandy islands of Simonszand, Rottumerplaat, Boschplaat, and Rottumeroog, located in that general order from W to E. Sand dunes stand on Rottumerplaat and Rottumeroog, the two larger islands. Boschplaat, which lies close S of Rottumerplaat, has a refuge shelter and a beacon standing on it. A house and a prominent framework beacon, 25m high, stand on Rottumeroog.

The shorebank, which fronts the seaward side of Rottumerplaat and Rottumeroog, is steep-to and forms the S side of Hubertgat. It extends 0.5 to 1.5 miles from these islands.

Several shallow channels, suitable only for small craft with recent local knowledge, lead between these islands to the inner waters. The fairways within these channels are marked, in places, by buoys and perches.

8.11 Borkum (53˚35'N., 6˚40'E.), the westernmost island of the Ostfriesische Inseln, has sand dunes up to 18m high standing on its N and W sides, but is low in its central part. The town of Borkum, a resort, is situated at the W end of the island. In addition to the light structures, the town can be identified by its large hotel buildings, a church, a water tower, and a disused light tower.

Borkum Great Light (53˚35'N., 6˚40'E.), a main light providing sectors for the Westerems Channel, is shown from a prominent brick tower, 60m high, standing on the W coast of Borkum.

A main light (Borkum Little Light) is shown from a prominent tower, 27m high, standing 0.6 mile S of Borkum Great Light. It provides sectors for the Hubertgat Channel.

A number of prominent beacons also stand on the island and may best be seen on the chart.

Borkumriff (53˚36'N., 6˚37'E.) extends up to 4.5 miles NW and 9 miles WNW from this island. Irregular depths and some drying patches may be found on this shore bank.

Borkum Great Light

Borkum Little Light

Borkum Hafen (53˚34'N., 6˚45'E.), a small harbor, is located at the SE end of the island and has a project depth of 7.5m. It consists of two basins, Schutzhafen and Kleinbahnhafen, and is entered from Randzelgat through Fischerbalje, a narrow entrance channel, which is marked by buoys and has a training wall along its NW side.

Schutzhafen, the larger of the two basins, has an entrance 70m wide and provides berths for coastal vessels and fishing boats with drafts up to 5m. Berths on the E side of the basin are reserved for navy vessels with drafts up to 7.3m.

It is reported (1998) that depths at the entrance and within Schutzhafen may be less than charted due to silting and irregular dredging.

Kleinbahnhafen has an entrance 65m wide and can be used by vessels with drafts up to 3m. This basin is used principally by small vessels ferrying passengers and freight to the light railroad which runs to Borkum.

Caution.—Caution must be observed when entering the entrance channel and harbor of Borkum Hafen with a strong SW wind and a flood tide.

8.12 Westerems Channel (53˚38'N., 6˚24'E.), the main entrance fairway, is entered 7.5 miles N of the E end of Schiermonnikoog. It leads ESE to the N part of Randzelgat where it is joined by Hubertgat. Borkumriff lies on the N side of this channel and Rottumer Bult, Ballon Plate, and Hubert Plate lie on the S side. Several wrecks and areas of foul ground lie in the vicinity of the fairway, but have swept depths in excess of 10m.

The entrance to this channel is marked by Westerems Fairway Lighted Buoy (53˚37'N., 6˚19'E.), which is equipped with a racon and moored 10 miles NE of Schiermonnikoog Light.

The fairway, which is marked by lighted buoys, has a dredged depth of 13.1m, which is reduced to 12.9m at the E end, near the junction with Randzelgat. However, lesser depths may be encountered due to temporary silting.

Hubertgat (53˚35'N., 6˚20'E.), a secondary channel, lies about 4.5 miles N of Schiermonnikoog. It leads between the shorebank fronting Rottumerplaat and Rottumeroog, on the S side, and the detached shorebank comprised of Rottumer Bult, Ballon Plate, and Hubert Plate, on its N side. Horsborn Plate, a detached shoal bank, lies on the N side of this channel, at the E

end. Numerous unmarked wrecks lie in the vicinity of this channel, but those lying within or near the fairway have been swept to depths in excess of 10m. The fairway, which is marked by buoys, has depths of 12 to 13m, but is no longer maintained by dredging. This channel changes frequently and is subject to silting.

The entrance to this channel is marked by Hubertgat Fairway Lighted Buoy (53˚35'N., 6˚14'E.), which is moored 6.5 miles NE of Schiermonnikoog Light.

Riffgat (53˚39'N., 6˚28'E.), a secondary channel which leads into the Westerems Channel, is entered about 5 miles N of the central part of Rottumerplaat. It is marked by buoys and leads between Brokumriff and a shoal patch, known as Geldsack Plate, lying close W. The entrance to this channel is marked by Riffgat Lighted Buoy (53˚39'N., 6˚27'E.), which is moored 9.5 miles NNE of the E end of Schiermonnikoog. The fairway is reported to have a least depth of about 6m, but the depths over the outer bar are subject to frequent large changes and deep-draft vessels are advised against using this channel.

Osterems (53˚38'N., 6˚47'E.), the E approach channel, is marked by buoys and entered between Borkum and the islands of Juist and Memmert. It is of little importance and suitable only for small vessels with local knowledge. Although there are depths of 4 to 18m within the channel, the fairway leading to the Ems is restricted by a bar at its S end, which has a depth of only 0.9m. The channel does provide access, through several small branches, to the small harbors of Greetsiel and Norden, which are located on the Ostfriesland coast. The entrance to the channel is marked by a fairway lighted buoy, which is moored 7 miles NNW of Borkum Great Light.

Ice.—The channels in the estuary seldom freeze over completely, but during severe winters, there is a considerable amount of drift ice in these waters. The winds and tidal currents have a great effect on the formation and movement of this ice. Generally, winds drive the ice to the leeward side of the channels and the windward sides are occasionally completely free. The wind influence usually prevails over that of the currents and it is only during gentle breezes that the currents can move the ice against the direction of the wind.

In Emshorn Plate, the greatest packing of drift ice occurs at LW. With a rising tide, the ice is carried into the Ostfriesisches Gatje and forms, especially with W winds, a solid pack which can be an obstacle to navigation. At this time, it is advisable not to enter the estuary without the help of icebreaker vessels which are normally available on request. During severe winters, vessels enter through the ice in convoys with the help of icebreakers; however, the lighted fairway buoys are removed and navigation is possible only during daylight hours.

The estuary is free of ice for about 30 per cent of winters. In the Westerems and the Randzelgat, the first ice may appear as early as the third week of December or as late as the latter part of January. In these same waters, the ice may disappear as early as the middle or latter part of January or as late as the latter part of March; on the average, it is gone by the middle of February. In extreme cases, the first ice was observed as early as the first week of December and the last ice as late as the third week of March.

During severe winters, the ice formation may impede low-powered vessels, but seldom does it prevent navigation on the river.

Tides—Currents.—Normally, the tides rise, at the entrance of the Hubertgat Channel, about 2.6m at springs and 2.2m at neaps. Off Knock (53˚20'N., 7˚01'E.), the tides rise about 3.3m at springs and 3m at neaps.

The direction, force, and duration of the winds greatly affect the direction and rate of the tidal currents and the rise and fall of the water level. With winds from the S to E, particularly SE winds, the rise of the tide may be reduced; whereas, with winds from W to N, particularly NW winds, the rise of the tide may be increased. At Emden, the highest reported HW was 3.9m above the MHW level and the lowest reported HW was 2.6m below the MHW level.

Seaward of the banks lying in the entrance of the estuary, the E current sets from about 5 hours 30 minutes before HW at Delfzijl to about 30 minutes after HW. It increases in force gradually and, under normal conditions, attains a maximum rate of about 1 knot, at about 3 hours before HW, before diminishing gradually. During stormy weather, this current attains a rate of 2 knots. Slack water lasts until about 1 hour after HW, at which time the W current begins to set. This current increases to a maximum rate of about 1 knot, at about 4 hours 30 minutes after HW, and then gradually diminishes again. During stormy weather, it attains a maximum rate of 1.8 knots.

In the Hubertgat channel, the E or incoming current first sets towards the openings between the islands E of Schiermonnikoog; however, when it gains strength it sets more in the direction of the channel.

In the Westerems channel, the E current sets generally in the direction of the channel and is strongest in the deepest depths. Both currents join off Borkum and set SE through Randzelgat and up the Ems, taking the direction of the channels. Generally, the W or outgoing current sets in the opposite direction to the incoming current.

Within Hubertgat and the Westerems channels, the mean rate of the currents, in both directions, is 1 to 1.5 knots. In the Dukegat channel, in the N entrance to Bocht van Watum, and near the harbor of Emden, the currents may attain rates of 2 to 3 knots at springs.

Pilotage.—See Pilotage (paragraph 8.3) and Regulations (paragraph 8.4) under Approach Routes to the German Bight for information and regulations concerning large vessels and vessels carrying dangerous cargo.

The regulations below apply to all other vessels.

Pilotage for Netherlands ports is compulsory for the following vessels:

1. For general traffic in the fairway between Westerems Lighted Buoy and Borkum—Vessels over 150m in length, 25m beam, or 7m draft.
2. For car ferries in the fairway between Westerems Lighted Buoy and Borkum—Vessels over 120m in length, 20m beam, or 7m draft.
3. In the fairway between Borkum and Eemshaven—Vessels over 90m in length, 13m beam, or 7m draft.
4. In the fairway between Eemshaven and Delfzijl—Vessels over 90m in length, 13m beam, or 6m draft.

Pilotage for German ports is compulsory for the following vessels:

1. Tankers carrying dangerous or polluting cargo, laden or unladen, if not declared gas-free.

2. Vessels over 90m in length or 13m beam.

Vessels bound for Netherlands ports employ Netherlands pilots and those bound for German ports employ German pilots. Vessels can embark pilots from pilot vessels, which are provided by both countries, in the vicinity of Westerems Fairway Lighted Buoy (53˚37'N., 6˚19'E.). During bad weather, the pilot vessels take shelter in the lee of Borkum.

Vessels must send an ETA at the boarding place and a request for pilotage at least 12 hours and 6 hours in advance or on departure from the last port. Requests for Netherlands pilots should be sent to Loodsdienst, Delfzijl through Scheveningen (PCH). Requests for German pilots should be sent to Emdlotse, Emden through Norddeich (DAN). Any delay in the ETA of more than 1 hour should be reported.

The German pilot vessel is painted black with the word “LOTSE” in white letters on both sides of the hull. The vessel has a yellow stack with a black rim and flies the German pilot flag (national flag with a white border) from the fore mast. At night, for identification, this vessel shows a long flash by searchlight every few minutes.

The Netherlands pilot vessel is painted black with the word “PILOT” in white letters on both sides of the hull. The vessel has a black stack and flies a blue flag with a white letter “L” from the aft mast. At night, for identification, this vessel shows short flashes for periods of 20 seconds at intervals not exceeding 5 minutes.

Regulations.—Traffic Control.—See Regulations—Traffic Control (paragraph 8.5) under Approach Routes to the German Bight for information concerning the Vessel Traffic Service (VTS) system applying to vessels navigating within the approaches to German Bight and proceeding to the River Ems, the River Jade, the River Weser, or the River Elbe.

A local Vessel Traffic Service (VTS) system operates in the River Ems and is mandatory for the following:

1. Vessels of 50m in length and over inbound from the German Bight.
2. Vessels of 40m in length and over within the local VTS area.
3. Vessels carrying dangerous cargo in bulk (gas, chemicals, petroleum, or petroleum products).
4. Nuclear-powered vessels.

Vessels must send reports, as follows:

1. An ETA must be sent to VTS Center Ems Traffic at least 24 hours before transiting the river or on departure from the last port.
2. A Sailing Plan (SP1) must be sent to VTS Center Ems Traffic on VHF channel 18 when approaching The Ems from N or E, as follows:
   a. Crossing latitude 54˚ 00'N.
   b. Crossing the longitude of GW7 Lighted Buoy (6˚ 54'E.).
3. A Sailing Plan (SP2) must be sent to VTS Center Ems Traffic on the appropriate VHF channel, if not already reported by an SP to German Bight VTS Center, as follows:
   a. Before entering the local VTS area from sea.
   b. Before entering the VTS area from a harbor or berth within the VTS area.
4. Deviation Reports (PR) or Incident Reports (IR) must be sent as necessary to VTS Center Ems Traffic on the appropriate VHF channel.
5. Position Reports (PR) must be sent to VTS Center Ems Traffic on the appropriate VHF channel when entering the VTS area, when entering or leaving a lock or berth, and when passing the following reporting points (RP):
   a. RP 1a—H1 Lighted Buoy (Hubertgat)—VHF channel 18.
   b. RP 1b—No. 1 Lighted Buoy (Westerems)—VHF channel 18.
   c. RP 1c—Riffgat Lighted Buoy—VHF channel 18.
   d. RP 1d—Osterems Lighted Buoy—VHF channel 18.
   e. RP 2a—A5/H15 Buoy (Hubertgat/Alte Ems, inbound only)—VHF channel 18.
   f. RP 2b—No. 13 Lighted Buoy (Westerems, inbound only)—VHF channel 18.
   g. RP 3—No. 35 Lighted Buoy (Hubertgat/Alte Ems, outbound only)—VHF channel 18.
   h. RP 4—No. 41 Lighted Buoy—VHF channel 20.
   i. RP 5—No. 65 Lighted Buoy (at same time, inbound report for Emden)—VHF channel 21.
   j. RP 6—Gandersum—VHF channel 15.
   k. RP 7—Papenburg—VHF channel 15.

The format for the SP and RP can be found under Regulations—Traffic Control (paragraph 8.5) under Approach Routes to the German Bight.

Vessels should also report on the appropriate VHF channel when intending to use one of the following roadsteads:

1. Emden Roads—VHF channel 21.
2. Dry cargo unloading area in Alte Ems—VHF channel 18.
3. Alte Ems Tanker Roadstead—VHF channel 18.
4. Gas Tanker Roadstead—VHF channel 20.

Other vessels may also use the Alte Ems Tanker Roadstead and the Gas Tanker Roadstead with prior permission of Emden Traffic Control, through VTS Ems on VHF channel 18 or 20.

Vessels over 50m in length bound for Emskai or Emden Harbor may navigate on the port side of the channel from No. 68 Lighted Buoy and No. 69 Lighted Buoy as long as Ems Traffic Control is informed immediately on VHF channel 21. Exceptions to the right-of-way prohibition requires agreement by the Traffic Center on VHF channel 20 or 21.

Vessels entering the local VTS area must maintain a continuous listening watch on the appropriate VHF channel of VTS Center Ems Traffic, or on VHF channel 16, as follows:

1. No. 1 Lighted Buoy to No. 35 Lighted Buoy (Westerems/Randzelgat)—VHF channel 18.
2. H1 Lighted Buoy to A5/H15 Buoy (Hubertgat)—VHF channel 18.
3. A5/H15 Buoy to No. 35 Lighted Buoy (Hubergat)—VHF channel 18.
4. No. 35 Lighted Buoy to No. 57/Oterdum-Reed Buoy—VHF channel 20.
5. No. 57/Oterdum-Reed Buoy to No. 86 Buoy—VHF channel 21.
6. No. 86 Buoy to Papenburg—VHF channel 15.

Regulations—General.—Extraordinarily Large Vessels on the River Ems are defined as those exceeding 290m in length, 45m beam, and 13.72m draft inbound, or 13.41m outbound, transiting from sea to Dukegat; those exceeding 260m in length, 40m beam, and 10.67m draft inbound, or 10.36m out-

bound, transiting between Dukegat and Emden; those exceeding 160m in length, 21m beam, and 5.9m draft inbound, or 5.5m outbound, transiting between Emden and Leerort; and those exceeding 120m in length, 18m beam, and 5.9m draft inbound, or 5.5m outbound, transiting between Leerort and Papenburg.

Such vessels are tide dependent and entry is allowed only if the maintained projected depths exist.

All Extraordinarily Large Vessels, high speed vessels, air cushion vehicles, and unusually large tug formations must obtain permission from the Water Police Authority at Emden 24 hours in advance of arrival at the pilot boarding position.

Oil, gas, and chemical tankers (including towed units), which are carrying hazardous goods in bulk or have done so but are not certified gas-free, are permitted to enter the River Ems only when the visibility is 1,000m or more and navigate the river only when the visibility is 500m or more. Such vessels may enter with permission of the Ems VTS.

See Regulations under the River Ems in paragraph 8.13 for additional requirements applying to liquid gas tanker.

Directions.—See Approach Routes to the German Bight in paragraph 8.4 for information concerning the Traffic Separation Schemes (TSS) and Deep-Water Routes situated in the approaches to the River Ems estuary.

When approaching from the N, vessels may pass through the TSS by way of Borkumriff Lighted Buoy (53˚47'N., 6˚22'E.), which is moored 11 miles N of the entrance to Westerems.

The main fairways within the River Ems are marked by lighted buoys, sector lights, and lighted ranges which may best be seen on the chart. Radar lines, which indicate the mid-channel tracks through the main fairways, are also shown on the chart.

Caution.—Numerous wrecks lie in the approaches and entrance to the estuary and may best be seen on the chart. Generally, wrecks lying in the vicinity of the entrance channels have been swept to depths in excess of 9m; most are marked by buoys.

Several National Park Wildlife Sanctuaries, the limits of which are shown on the chart, are situated along the banks adjacent to the estuary. Entry into these areas is restricted.

Several submarine pipelines and cables lie in the approaches and within the estuary and may best be seen on the chart.

Due to the existence of ground mines within Westerems, which were disarmed but not cleared, caution is necessary when anchoring or fishing.

Not all water areas in the approaches have been swept for mines; however, the mine danger for surface navigation is currently not considered to be greater than other dangers to marine traffic.

During gales from W to NW and especially with a falling tide, heavy seas may be encountered within the Westerems Channel. In addition, during onshore winds, breakers may occur on the shoal areas in the vicinity.

The River Ems

8.13 Randzelgat (53˚34'N., 6˚40'E.) is the continuation of the main fairway up the river. It leads SE from the confluence of Hubergat and the Westerems Channels, off the W side of Borkum, to the junction with Dukegat. The extensive drying bank of Randzel lies on the NE side of this channel and the shoal bank of Mowensteert lies on the SW side.

The fairway in the channel, which is marked by lighted buoys, has dredged depths of 12.8m at the W end and 10m at the SE end.

Alte Ems (53˚31'N., 6˚41'E.), a secondary channel, is marked by buoys and is separated from Randzegat by Mowensteert, a shallow shoal bank. This channel, which was formerly the main channel, is entered from the N part of Randzelgat and leads SE into Dukegat. The fairway is fairly deep, but is subject to frequent depth changes. Anchorage berths lie within this channel.

Dukegat (53˚28'N., 6˚52'E.) leads SE from Randzelgat between Emshorn Plate, on its NE side, and Robben Plate and Hundsteert, on its W and S sides. It is divided by Dukegat Plate, a narrow shoal area which lies in mid-channel. The main fairway, which is marked by lighted buoys, leads SW of this shoal area and has a dredged depths of 10m at the N end and 9m at the S end. This channel leads into the N part of Ostfriesisches Gatje.

Ostfriesische Gatje (53˚23'N., 6˚58'E.), dredged to a depth of 9m, leads SSE from the S end of Dukegat to a position close S of Knock (53˚20'N., 7˚01'E.). From here, vessels may proceed SSW into the port of Delfzijl or E, through Emder Fahrwasser, to the port of Emden. Within this main fairway, deep-draft vessels have the right of way over light-draft vessels.

Regulations.—Below are extracts from the German river special regulations concerning navigation of liquid gas tankers in the River Ems.

An escort by the Water Police is required by the following liquid gas tankers:

1. Vessels with load capacity between 5,000 and 20,000 cubic meters from No. 44 Lighted Buoy to Emden.
2. Tide dependent vessels with cargo exceeding 20,000 cubic meters from No. 26 Lighted Buoy to Emden.

The following rules apply to liquid gas tankers exceeding a load capacity of 2,500 cubic meters:

1. Vessels must enter and depart through Westerems Channel.
2. Two VHF radios must be operable and capable of communications with Ems radar stations and other ships.
3. Vessels with the right-of-way and oil, gas, and chemical tankers proceeding in the same direction must not enter a safety zone extending 2 miles ahead or astern of the liquid gas tanker.

The following rules apply to liquid gas tankers exceeding a load capacity of 30,000 cubic meters:

1. Two pilots must be employed and the vessel must accept radar assistance from the radar stations.
2. In addition to the two previously-mentioned VHF radios, the vessel must be equipped with two radars, one electric log, and one engine revolution indicator, which are all serviceable.
3. Between No. 10 Lighted Buoy and No. 30 Lighted Buoy, speed is limited to a maximum of 14 knots; then to No. 57 Lighted Buoy, speed is limited to a maximum of 12 knots.
4. A minimum of two tugs must be secured for the passage between No. 57 Lighted Buoy and Emden.

5. Entry into Emden is prohibited during the first 3 hours and 30 minutes of the incoming tidal current.

The following additional rules apply to liquid gas tankers loaded with a cargo exceeding 30,000 cubic meters:

1. The draft must not exceed 10.22m.
2. Tugs must be secured at No. 29 Lighted Buoy.
3. A vessel inbound must have passed No. 57 Lighted Buoy at least 1 hour before HW at Emden.

Additional traffic regulations apply to liquid gas tanker proceeding above No. 46 Lighted Buoy and No. 47 Lighted Buoy (Gatjebogen).

Anchorage.—Borkum Reede (53˚33'N., 6˚41'E.), a designated anchorage area, lies on the S side of the main fairway in Randzelgat and has depths of 15 to 19m.

Vessels with drafts suitable to enter Osterems may anchor, in depths of 13 to 18m, within an area lying on the N side of Borkum, in Voorentief.

A large designated anchorage area lies in Alte Ems (53˚30'N., 6˚45'E.) and has depths of 10 to 13m. The NW section, known as Alte Ems Reede, is a general anchorage; the central section is an explosives anchorage; and the SE section is a tanker anchorage. The SE section may be used on request by vessels other than tankers.

Dukegat Reede, a designated anchorage area, lies in the SE part of Alte Ems and has depths of 11 to 15m. It is used as a transshipment and lightening anchorage.

Due to the changeable depths in the N part of Alte Ems, vessels generally approach the anchorages in this vicinity from S via Westerems Channel and the main fairway in Randzelgat. This route has a least depth of 12.5m as far as the designated anchorages in Alte Ems.

Vessels with draft up to 13.7m can reach Dukegat Reede at HW. It is reported (2001) that vessels up to 92,600 dwt, 258m in length, 36m beam, and 13.7m draft have used this lightening anchorage area prior to proceeding to Emden.

Gas Tanker Anchorage (53˚25'N., 6˚57'E.), a designated area, lies on the E side of the main fairway in Ostfriesische Gatje. It has depths of 8 to 11m and is used by gas tankers with a length less than 230m and a draft less than 7m.

The limits of the above anchorage areas are marked by buoys and may best be seen on the chart.

Caution.—High speed craft operate between Borkum and Emden.

Depths within the channel outside of the main fairway change frequently.

Between Emden and Leerort (53˚13'N., 7˚26'E.), numerous fishing nets are placed between stakes, clear of the main fairway, from the middle of March to May, annually.

A ferry crosses the river near Ditzum (53˚20'N., 7˚16'E.).

8.14 Eemshaven (53˚27'N., 6˚50'E.), a port, is located on the S shore of Dukegat channel. The harbor consists of an entrance channel and three tidal basins.

Tides—Currents.—Tides rise about 3m at springs and 2.7m at neaps.

Depths—Limitations.—Doekgatkanaal, the entrance fairway, leads between two breakwaters and has a dredged depth of 10.1m.

Wihelminahaven, the basin on the E side of the harbor, is 600m long and has depths of up to 15m. Julianahaven, the basin on the W side, is 1,200m long and has depths up to 13.1m. Emmahaven, another basin on the W side, is 500m long and has depths up to 8.1m.

There are facilities for tanker, LPG, chemical, ro-ro, passenger, bulk, container, general cargo, ferries, and offshore oil and gas exploration support vessels. Vessels up to 40,000 dwt, 250m in length, and 10.5m draft can be accommodated. An underkeel clearance of 10 per cent is required.

Aspect.—The entrance fairway is indicated by lighted ranges which may best be seen on the chart. A conspicuous chimney, 128m high, stands on the shore at a power station, about 2 miles SE of the harbor entrance. A prominent radar tower, 38m high, stands on the S breakwater of a small intake basin, close N of the above chimney.

Pilotage.—See Pilotage for the River Ems (paragraph 8.12).

Regulations.—A Vessel Traffic Service (VTS) system operates in the roadstead approaches and main fairways of Eemshaven and Delfzijl harbors. For more information, see Regulations for Delfzijl in paragraph 8.15.

Vessels over 230m in length and/or with a draft of 10m or more, when navigating in the approaches of the port, are required to display the appropriate shape or lights for vessels constrained by their draft as per Rule 28 of the International Regulations for Preventing Collisions at Sea (1972).

Caution.—The dredged entrance fairway has sides which shoal steeply and vessels are recommended to remain strictly on the alignment of the lighted ranges.

Depths within the harbor basins may be less than charted due to irregular dredging.

Delfzijl (53˚20'N., 6˚56'E.)

World Port Index No. 30990

8.15 The port of Delfzijl is located on the SW side of the Ems and provides access, via a lock, to Eemskanal, which leads 14 miles WSW to Groningen. Coasters and small craft can enter the inland waterway system at Groningen and reach the S part of the Netherlands and the Rhine.

Tides—Currents.—Tides rise about 3.5m at springs and 3.2m at neaps.

The tidal currents frequently set strongly near the harbor and squarely across the entrance.

Depths—Limitations.—The main harbor consists of two basins which are situated 2.7 miles W of the entrance. Paapsund Sud leads from the main river fairway into Zeehavenkanaal. This short channel has a least depth of 7.3m. Zeehavenkanaal, protected by a breakwater on its N side, then leads to the basins. This narrow channel has a least depth of 10m.

Several private factory jetties are situated along the S side of Zeehavenkanaal. They have depths up to 9.9m alongside and can handle vessels up to 200m in length. Handelshaven has depth of 7 to 8.9m alongside. This basin provides 570m of berthage at its W side and has a main quay, 650m long, at its

NE side. There are also facilities for offshore oil and gas exploration support vessels.

Damsterhaven is entered from the W side of Handelshaven. The entrance is spanned by a movable bridge and can be used only by vessels with a beam of 10.5m or less. The basin has 140m of berthage with a depth of 4.4m alongside.

Vessels up to 220m in length and 9m draft can be accommodated within the harbor. An underkeel clearance of 10 per cent is required.

The locks providing access to the Eemskanaal are situated on the S side of harbor. Vessels up to 120m in length, 16m beam, and 5.2m draft may enter and transit the canal to Groningen.

Oosterhornhaven, an inner harbor at Delfzijl, is entered from the canal and contains a number of private industrial berths. It can handle vessels up to 75m in length, 12.5m beam, and 4.5m draft.

Aspect.—The entrance fairway is indicated by a lighted range which may best be seen on the chart. A conspicuous silo stands on the S side of Zeehavenkanaal, 1 mile W of the port entrance.

A main light is shown from a conspicuous tower, with four galleries and a radar scanner, standing on the N side of the Ems at Knock, 1.5 miles NNE of the port entrance.

Pilotage.—See Pilotage for the River Ems (paragraph 8.12).

Regulations.—A Vessel Traffic Service (VTS) system operates within the roadsteads and main fairways of Eemshaven and Delfzijl harbors. This system, which has both English and Dutch as official languages, is mandatory for all ocean-going vessels. It is managed by the Harbor Coordination Center (HCC), which has a direct line of communication with the River Ems VTS (see paragraph 8.12).

All vessels within the VTS area sectors must keep a continuous listening watch on the appropriate VHF channel. Such VHF channels are displayed on sector notice boards along the fairways.

Ocean-going vessels should send a report to the HCC at least 24 hours prior to arriving at the port entrance. The report must state the vessel's name, type, position, and destination. All vessels must report when passing each sector boundary, entering or leaving a harbor, crossing a fairway, leaving a berth, turning, or swinging.

Radar assistance is available on request. A general message for shipping is broadcast at 10 minutes past every even hour on VHF channel 66.

Below are extracts from the port regulations:

1. Inbound traffic in Paapsund Sud has priority over outbound traffic.
2. Ocean-going vessels navigating in Zeehavenkanaal are prohibited from overtaking.
3. When ocean-going vessels navigating in Zeehavenkanaen are likely to meet on opposite courses within 100m of a berthed vessel W of No. 5 Lighted Beacon, the vessel having the berthed vessel on its starboard side shall give way to the other vessel.
4. Ocean-going vessels over 130m in length or having a draft of 7.5m or more, when navigating in Zeehavenkanaal, must display the appropriate shape or lights for a vessel constrained by its draft.

Emden (53˚20'N., 7˚11'E.)

World Port Index No. 30950

8.16 Emden, the westernmost port of Germany, is located on the Ems, 39 miles above Westerems Fairway Lighted Buoy. It is one of the most important transshipment ports for bulk cargo, which is imported to and exported from the Ruhr via the Dortmund-Ems Kanal. In addition, the port is also connected to the River Jade and the River Weser via Wilhelmshaven and the Ems-Jade Kanal.

Tides—Currents.—The tide at the port entrance rises about 3.6m at springs and 3.3m at neaps.

Strong winds, particularly from WNW and NW, raise the water level and winds from the SE lower it.

The tidal currents set in the direction of the approach channel and across the harbor entrance. In the W part of the approach channel, the incoming current begins to set about 5 hours 45 minutes before HW at Emden and attains a maximum rate of 2.3 knots at springs. The outgoing current begins to set at about the time of HW and attains a maximum rate of 2.5 knots at springs.

Depths—Limitations.—The port is approached through a dredged entrance channel, with a controlling depth of 8.5m, and consists of an outer harbor and an inner harbor.

Aussenhafen, the outer harbor basin, is tidal. The inner harbor consists of an extensive wet dock complex, which is formed by several interconnected basins. Overhead power cables, with a vertical clearance of 43m, span these harbors.

Emskai, a general cargo quay with a ro-ro ramp at the E end, is situated on the N side of the bank, close W of the entrance to the outer harbor basin. It is 272m long and has a depth of 8.5m alongside.

Aussenhafen, the outer harbor basin, provides about 1,100m of main commercial quayage with depths of 8.5 to 9m alongside.

The inner harbor wet dock complex can be entered through two locks. Nesserland Lock is situated at the N end of Aussenhafen and leads into the S end of Binnenhafen. It is 110m long, 14.3m wide, and has a depth of 3.5m over the sill. A lifting road bridge spans the S end of the lock. In addition, two bascule bridges span Binnenhafen, about 1 mile NNE of the lock. They both have a navigable width of 17.3m.

Vorhafen, a basin, branches NE from close inside the harbor entrance and forms the approach to Grosse Lock, which leads into Neuer Binnenhafen. This main lock is 260m long, 40m wide, and has a depth of 10m over the sill. Generally, vessels up to 255m in length, 35.5m beam, and 10.7m draft can be handled. However, vessels over 240m in length and 33m beam require special permission.

The main quays within Neuer Binnenhafen include Sudkai, 932m long, and Nordkai, 480m long, which have depths of 11.9m and 11.5m alongside, respectively.

Industriehafen, another main basin, has 1,000m of total berthage with depths up to 10.5m alongside. Stichkanal, a basin, is entered from the N side of Industriehafen. It has 350m of berthage with depths of 7m alongside.

The port has facilities for general cargo, bulk, container, ro-ro, ferry, tanker, LPG, timber, fishing, and automobile carrier vessels. Vessels up to 10.67m draft can be handled at HW. It is

reported (2002) that vessels up to 11.25m draft can be handled at HWS.

After lightening at the Dukegat Reede in Alte Ems (paragraph 8.14), vessels up to 92,600 dwt, 258m in length, 36m beam, and 10.7m draft have entered the port at HW.

There is also a dry dock in the port which can handle vessels up to 55,000 dwt, 218m in length, 29m beam, and 6.9m draft.

Pilotage.—See Pilotage for the River Ems (paragraph 8.12).

Regulations.—For details of the River Ems VTS system, see Regulations-Traffic Control under the Ems Estuary (paragraph 8.12).

Vessels entering the harbor from the main river fairway during the flood tidal current have precedence over all other vessels.

Vessels departing through Vorhafen have precedence over those departing through Aussenhafen.

8.17 **Der Dollard** (Der Dollart) (53˚18'N., 7˚10'E.), a large and shallow bay, indents the S bank of the river, S of Emden. With the exception of a small harbor lying at the head, which provides access to the inland waterway system, the bay is of little importance to general shipping as it is almost entirely obstructed by drying flats. The border between the Netherlands and Germany is situated in the E part of this bay.

The River Ems is navigable by small ocean-going vessels as far as the port of Papenburg, 22 miles from Emden. The port of Leer is situated on the Leda River, which joins the Ems at Leerort (53˚13'N., 7˚26'E.), 15 miles above Emden. The Dortmund-Ems Kanal is entered from the river through a lock at Oldersum (53˚19'N., 7˚20'E.), 6 miles above Emden. The small port of Weener is situated on the W bank of the river, 3.5 miles above Leerort.

The fairway in the river is narrow and tortuous and is marked by buoys as far as Leerort. Above Leerort, beacons, fitted with reflectors, stand on the banks and indicate the course of the fairway.

A flood barrage is situated on the River Ems about 4 miles above the entrance to Emden. The main opening for shipping is 60m wide and has a depthof 9m over the sill. A secondary opening, for barges bound upriver only, is 50m wide and has a depth of 7m over the sill. It has a vertical clearance of only 5.75m.

Overhead cables span the river 0.8 mile NE and 1.5 miles S of Weener (53˚10'N., 7˚22'E.). The have a minimum vertical clearance of 50m.

A bascule road bridge, with two passages, spans the river 0.4 mile below Leerort. The E passage has a navigable width of 40m and the W passage has a navigable width of 43m.

A bascule rail bridge spans the river 0.4 mile above Weener. It has a navigable width of 24m.

The fairway has a controlling depth of 3.8m as far as Papenburg. The water level of the river above Emden is affected by freshets and the wind. Strong W winds sometimes cause the water to rise almost 0.6m above the normal level; strong E and SE winds cause a noticeable lowering of the water level. The tidal influence is felt as far as Papenburg; at springs, the tide rises up to 3m at Leerort and up to 2m at Papenburg.

Ditzum (53˚19'N., 7˚17'E.) is located on the S bank of the river, 4 miles above Emden. It has a small tidal harbor which provides 150m of berthage, with a depth of 3.5m alongside at HWS. Vessels up to 30m in length can be handled.

Leer (53˚14'N., 7˚27'E.) (World Port Index No. 30960), a small port, is entered via a lock, spanned by a drawbridge, from the Leda River. The lock is 192m long, 26m wide, and has a depth of 7m on the sill at HW. Vessels up to 3,000 dwt and 5m draft can enter. The harbor, which consists of two wet basins, provides 500m of berthage with depths of 4 to 6m alongside.

Weener (53˚10'N., 7˚22'E.), a small town, stands on the W bank of the river, 4 miles above Leerort. The small harbor is mostly used by inland waterway vessels and pleasure craft. It has a depth of 2.2m alongside at HWS and is entered through a lock which is only 10m wide.

Papenburg (53˚06'N., 7˚23'E.) (World Port Index No. 30970) is located at the head of a short canal which leads from the E bank of the river, 22 miles above Emden. The harbor consists of a wet basin complex which is entered through two locks. The main entrance lock is 152m long, 26m wide, and has a depth of 6m over the sill. The other lock is 45m wide and has a depth of 7m over the sill. It has no chamber and is used for large vessels. The harbor provides 3,000m of total berthage with depths of 3 to 6m alongside. There is also a large shipbuilding yard. Vessels up to 250m in length, 43m beam, and 5.5m draft can be accommodated.

The Ems Estuary to the River Jade and the River Weser

8.18 The Ostfriesland coast between the Ems Estuary and the Jade Estuary is fronted by Juist, Norderney, Baltrum, Langeoog, Spiekeroog, and Wangerooge. All of these islands, with the exception of Juist, lie within 5 miles of the mainland. Shallow banks lie off the seaward sides of these islands and drying flats and shallow channels occupy the water areas to the S of them; only small craft can navigate through these areas.

All of the islands are composed of fairly high and bare sand dunes which makes it difficult to identify them. A village stands on the W end of each of the islands and there are small harbors fronting the villages on Norderney and Langeoog. Several radio masts stand on Norddeich and are visible from seaward. The church at Esens, on the mainland, is also visible from seaward on some bearings.

The channels lying between the islands provide access to the small harbors on the islands and also to the shallow fairways which lead to several small harbors on the mainland. These harbors include Norddeich, Nessmersiel, Dornumersiel, Westerackumersiel, Bensersiel, Neuharlingersiel, and Carolinsiel. The islands are popular resorts and many small ferries run between them and the mainland.

Ice.—On the seaward sides of the Ostfriesische Inseln, ice forms on the shallow shorebanks during severe winters, but it does not extend far enough seaward to affect the coastal traffic. However, in the channels lying between the islands and on the flats, enough ice occasionally forms to close the area to navigation for extended periods of time.

Tides—Currents.—The tide rises in these waters 2.7 to 3m at springs and 2.4 to 2.7m at neaps.

In the waters N of the Ostfriesische Inseln, the tidal currents set in an E and W direction. The times at which the currents

begin and the directions in which they set are subject to considerable variations and are perhaps affected by the currents setting into and out of the channels lying between the various islands.

About 9 miles NW of Norderney Light, the E tidal current sets about 4 hours and 1 hour before HW at Helgoland (the reference port). Its rate at springs varies between 0.7 and 1.5 knots. The W current sets from about 2 to 6 hours after HW and attains a rate at springs up to 1.3 knots. These currents in turning from an E to a W set follow a counterclockwise rotary direction; at such times the rate of the current may be up to 0.5 knot. Slack water occurs at about 5 hours 30 minutes before HW and at about 30 minutes after HW.

In all the channels lying between the islands, the incoming currents set S and the outgoing currents set N; these currents are strongest in the deepest channels.

After passing between the islands, the incoming current from each entrance channel spreads out and sets S and then E and W behind the islands. At first, these currents set through the channels, but as the tide rises they set across the flats.

Caution.—A large ammunition dumping ground area lies 6.5 miles N of Spiekeroog and may best be seen on the chart.

Numerous shoal patches and shallow depths lie within 2.5 miles of the shore.

Numerous wrecks and several isolated foul areas lie offshore and may best be seen on the chart. Most of the wrecks have been swept and some are marked by buoys.

Several submarine pipelines and cables extend from the shore along this section of coast and may best be seen on the chart. Extreme caution should be exercised when navigating in the vicinity of gas pipelines.

Many parts of the islands and drying banks fronting the Ostfriesland coast are designated as nature reserves.

8.19 Memmert (53˚38'N., 6˚53'E.), an island covered by sand dunes, lies 2.5 miles NE of the E end of Borkum. A prominent disused light tower stands on its SW coast.

Juister Riff, a large shelving shorebank, extends up to 6.5 miles WNW from Memmert and merges with Borkumriff in the S part of the entrance channel.

Juister Balje, a shallow channel, leads along the W and N sides of Memmert to a pier situated on the S side of Juist. It then continues E to Norderneyer Seegat.

Juist (53˚40'N., 6˚52'E.), a long and narrow island, is marked by sand dunes which stand on its W and central parts and rise to a height of 20m. Several villages, with prominent buildings, are situated near the central part of this island, to the S of the dunes. Conspicuous beacons stand near the E and W ends. A conspicuous round water tower stands near the center of the island and a prominent hotel stands close W of it. An aeronautical light is shown near the airfield, which is situated in the E part of the island.

Norderney (53˚43'N., 7˚15'E.), the largest of the Ostfriesische Inseln, is the principal beach resort in the islands.

A chain of sand dunes, up to 21m high, stretches across the N side of the island, except at the E end which is low. The highest group of dunes stands near the center and is known as Weisse Dune because of their whitish color.

A main light is shown from a conspicuous red brick tower, 54m high, standing near the center of the island.

Norderney Light

A town, with a small harbor close S of it, is situated at the W end of the island. Prominent landmarks in the town include several buildings, a square water tower, the chimney of the power station, the church tower, and a school with a conical turret. Norderney Beacon, 12m high, stands on a dune, 15m high, close W of the town and is conspicuous. Several other beacons stand on the island including a prominent one, 10m high, at the E end.

Norderneyer Seegat, a buoyed channel, leads between Juist and Norderney, and provides access to the small harbor at the W end of Norderney and to Norddeich, situated on the mainland. Schluchter and Dove Tief, two entrance channels, lead over the shoals in the zeegat to a deep lying off the W end of Norderney. From this deep, Buse Tief leads S to Norddeich and Riff Gat leads E past the harbor on Norderney and over the flats on the S side of this island. Both of these entrance channels are shallow, subject to frequent changes, and at times silt up completely. Dove Tief has depths of less than 2m and Schuchter has depths of 0.3 to 2m. Buoys and ranges, which mark the fairways, are removed when the channels occasionally silt up. The entrances to the channels are marked by lighted buoys which may best be seen on the chart.

The harbor at Norderney consists of an enclosed basin, with dredged depths of 2.5m, which is used by fishing boats, small passenger vessels, and coasters. It usually silts up to a depth of 2m. A berth at the head of a pier outside the harbor has a depth of 5m alongside and can be used by larger vessels.

Norddeich (53˚38'N., 7˚10'E.) (World Port Index No. 30940), a small port, is located on the mainland, S of Norderney. It is approached through Buse Tief and then entered through a channel, 1.2 miles long and 50m wide, contained between two stone training walls. These walls are covered at HW and marked by stakes. The fairway is indicated by lighted ranges. Prominent landmarks in the town include the water tower and the railroad station. Several conspicuous radio masts stand close S of the town.

Small coasters up to 60m in length and 4m draft can be accommodated in the harbor at HW.

Baltrum (53˚44'N., 7˚24'E.), the smallest of the island group, is separated from Norderney by Wichter Ee. The W and middle parts of this island are marked by sand dunes, 15m

high, whereas the E end is low. A village stands near the W end of the island and another stands near the middle, along the S side. Prominent beacons stand 0.5 mile W of the E end of the island and near the middle. A pier, with a berth 200m long, extends from the SW shore and has a depth of 3m alongside at HW. Wichter Ee, the shallow passage, is available only to small craft.

8.20 **Langeoog** (53˚45'N., 7˚32'E.) has a chain of sand dunes, 15 to 20m high, standing along its N shore. They are grouped in such a manner that, from seaward, they appear to be three islands. A small harbor is located 1 mile S of the main village which stands on the W end of the island. It is well-sheltered, but the depths alongside the berthing facilities are very shallow. The church tower, the water tower, and a framework mast standing in the village are all prominent from seaward. In addition, a prominent beacon stands on the E end of the island. The high church steeple at Esens, on the mainland S of the E end of the island, is also visible from offshore.

Ackumer Ee (53˚43'N., 7˚27'E.), a narrow channel, leads between Baltrum and Langeoog and provides access to the small harbors on the latter island and on the mainland. This shallow channel is used principally by fishing boats and small coasters with local knowledge.

Spiekeroog (53˚46'N., 7˚44'E.) has sand dunes up to 20m high standing on its W part, but is low elsewhere. A village is situated near the W end of the island and a prominent beacon stands on the dunes close NE of it. A wind gauge stands on the W extremity of the island and a beacon stands at the E extremity. A pier extends from the S shore of the island and has a depth of 4m off the head at HW.

Otzumer Balje (53˚46'N., 7˚38'E.), a channel marked by buoys, leads between Langeoog and Spiekeroog and provides access to the pier on the latter island and to the small mainland harbor of Neuharlingersiel. The buoys are frequently moved to conform to the shifting channel.

Wangerooge (53˚47'N., 7˚54'E.), the easternmost island of the group, is located on the S side of the entrance to the Jade estuary. The dunes on this island do not exceed a height of 15m and change shape frequently. The island is a resort; several large buildings stand on it. A small airfield is situated near the center. Strand Beacon stands near the E end of the island, on the S side. It is 16m high and prominent.

Wangerooge Light (53˚47'N., 7˚52'E.), a main light with directional sectors for the approach to the River Jade, is shown from a conspicuous tower, 64m high, standing near the W end of the island. West Tower, prominent and 52m high, is situated 0.3 mile S of this light.

A conspicuous disused light structure stands near the center of the island, 1.5 miles E of the light; a prominent signal station is situated 0.3 mile NNW of it.

Harle (53˚47'N., 7˚50'E.), a channel marked by buoys, leads between Spiekeroog and Wangerooge and provides access to the branching channels S of these two islands. These branching channels lead E to join the Jade estuary, S to the small harbor at Carolinensiel, and W to join the fairway S of Spiekeroog. The approach channel leading to the bar at the entrance is marked by a lighted buoy, which is moored about 2.3 miles NW of Wangerooge Light. Several groins extend into the channel

Wangerooge Light

Wangerooge West Tower

Wangerooge Disused Light Tower

from the shore at the W side of the island and act as breakwaters.

Caution.—Foul areas (explosives) lie centered 3 and 7 miles NW of the W end of Wangerooge in the approaches to the Jade estuary and may best be seen on the chart.

The River Jade and the River Weser Estuary

8.21 The estuary, through which the River Jade and the River Weser reach the sea, is contained between the islands of Wangerooge and Scharhorn. The latter island lies on the S side of the entrance to the Elbe, 18 miles NE of Wangerooge. The greater part of this water area is occupied by large coastal flats and extensive shoals.

The two rivers are approached through the W part of this estuary, all entrance channels being within 8 miles of Wangerooge. The E part of the estuary is comprised largely of shallow waters which extend up to 22 miles from the mainland, and which are navigated only by small vessels with local knowledge; Norder Grunde and Scharhorn Riff form the outer shoals of these shallow waters. The entrance to the River Elbe is described in paragraph 9.2.

The River Jade, a fairly deep and wide waterway, is entered N of Wangerooge and provides access to the port of Wilhelmshaven, which is located on the W side of the river, 23 miles above the entrance. Above Wilhemshaven, the Jade leads into a large bay, known as Jade Busen, which is for the most part, very shallow.

The River Weser leads to the ports of Bremerhaven, Nordenham, Brake, Elsfleth, Oldenburg, Vegesack, and Bremen. In addition, this river is connected to the extensive inland waterway system. This river has two entrance fairways; Neue Weser, formerly known as the Alte Jade, is the W entrance fairway and is entered 5 miles N of Wangerooge. Alte Weser, the N entrance fairway, is entered 8 miles N of Wangerooge. The River Weser is separated from the Jade by the extensive sands and shoals which extend NW from the peninsula of Butjadingen, located E of the port of Wilhelmshaven.

GB Lightfloat (54˚11'N., 7˚28'E.), equipped with a racon, is moored 14 miles NNW of Jade/Weser Lighted Buoy.

Jade/Weser Lighted Buoy (53˚58'N., 7˚39'E.), equipped with a racon, is moored 13.2 miles NW of Wangerooge Light.

Jade 2 Lighted Buoy (53˚52'N., 7˚47'E.), equipped with a racon, is moored 5.2 miles NNW of Wangerooge Light.

Schlusseltonne Lighted Buoy (53˚56'N., 7˚55'E.) is moored about 9 miles NW of Alte Weser Light.

Alte Weser Light (53˚52'N., 8˚08'E.) is shown from a prominent tower, 33m high, which has a broad overhanging gallery and is surmounted by a radar scanner.

Tegeler Plate Light (53˚48'N., 8˚11'E.) is shown from a prominent tower, 24m high, which has a projecting gallery.

Mellumplate Light (53˚46'N., 8˚06'E.) is shown from a prominent square tower, 30m high, which is surmounted by a helicopter platform. At night, the fixed directional light indicates the entrance leading line. Flashing lights, shown from the same tower, indicate narrow sectors on each side of the line.

Alte Weser Light

Tegeler Plate Light

Mellumplate Light

Roter Sand Tower (53˚31'N., 8˚05'E.), a disused light structure, stands 1.8 miles WSW of Alte Weser Light. It is 28m high and conspicuous.

Winds—Weather.—Strong winds from the NW quadrant increase the water level and those from the SE quadrant lower it.

Roter Sand Tower

In exceptional instances, the water level has been raised as much as 3.5m above MHW.

Fog occurs throughout the year, but is most prevalent from November through February.

Ice.—Drift ice may be encountered only during severe winters in the approaches to the Jade and the Weser. Ice conditions in the approaches generally consist of mainly new ice and ice cakes with some small floes. In the rivers, thick pack ice can accumulate; however, large vessels are generally not affected. The first ice appears about the middle or latter part of December and remains until the latter part of February. The navigable fairway channels never freeze over completely, but the hindrance to navigation is generally caused by floating ice which has broken away or which has been driven in by winds and currents.

Tides—Currents.—The tide off the entrance to the estuary rises about 2.8m at springs and 2.5m at neaps.

From a position located 12.5 miles N of Wangerooge, the tidal current begins to set E at 5 hours 15 minutes before HW at Helgoland (the reference station) and attains a rate of 0.7 to 1 knot at springs. The W current begins between 1 hour and 1 hour 15 minutes after HW and attains a rate of 0.5 to 0.7 knot at springs.

Closer to the entrance of the estuary, the tidal currents set in a general ENE and WNW direction and attain rates of up to 1.3 knots at springs.

Off the N side of Norder Grunde, the direction and rates of the tidal currents vary greatly. Rates between 0.5 and 2.3 knots have been observed. Directions between 024˚ and 085˚ and between 270˚ and 321˚ have been observed.

Pilotage.—See Pilotage (paragraph 8.3) under Approach Routes to the German Bight for information and pilotage regulations concerning large vessels and vessels carrying dangerous cargo.

The regulations below apply to all other vessels.

Pilotage is compulsory for tankers carrying dangerous or polluting cargo, laden and unladen, if not declared gas-free; for vessels over 90m in length; and for vessels with a beam greater than 13m, which navigate the Jade or Weser.

Inbound vessels bound for the Jade should send a request for pilotage, stating port of destination and ETA at Jade 2 Lighted Buoy, 12 hours in advance or on departure from last port to Jadelotse Wilhelmshaven.

Vessels bound for the Weser should send their request 24 hours in advance to Weserlotse II, Bremerhaven through Norddeich (DAN).

The requests should be confirmed 6 hours and 2 hours prior to arrival. Vessels with drafts over 15m are advised to employ two pilots.

The pilot may be contacted by VHF and will generally board in the vicinity of Jade 2 Lighted Buoy (53˚52'N., 7˚47'E.). In bad weather, the pilot vessel shelters within the Neue Weser, between No. 17/H-Reede Lighted Buoy and No. 19/H-Reede Lighted Buoy. The pilot vessel is a swath type (twin-hulled) and is reported (2002) to be painted orange.

Deep-sea pilots for the North Sea and English Channel are also available.

Regulations—Traffic Control.—See Traffic Control (paragraph 8.5) under Approach Routes to the German Bight for information concerning the Vessel Traffic Service (VTS) system applying to vessels navigating within the approaches of the German Bight and proposing to enter the River Ems, the River Jade, the River Weser, or the River Elbe.

See Regulations-Traffic Control under The River Jade (paragraph 8.23) or The River Weser (paragraph 8.27) for information concerning local VTS systems operating within the approaches and fairways of each river.

Anchorage.—A Deep-Water Anchorage Area, the limits of which are shown on the chart, lies close W of the Jade-Approach TSS. It is reported (1983) that the holding ground is poor.

Norde Reede (53˚54'N., 7˚50'E.), a designated anchorage area, lies centered 2.4 miles NNE of Jade 2 Lighted Buoy (53˚52'N., 7˚47'E.) and has depths of 16 to 21m.

Neue Weser Reede (53˚51'N., 7˚51'E.), a designated anchorage for large and deep-draft vessels, lies centered 2.4 miles ESE of Jade 2 Lighted Buoy (53˚52'N., 7˚47'E.). It is marked by buoys and has depths of 12 to 20m.

The limits of the above anchorage areas may best be seen on the chart.

Directions.—Vessels from the NW bound for the River Jade or the River Weser should approach the pilot boarding area via GB Lightfloat (54˚11'N., 7˚28'E.), the Jade Approach TSS, and the Precautionary Area. Vessels from N or NE should make for Jade 2 Lighted Buoy (53˚52'N., 7˚47'E.). Vessels from the W should approach via the Off Terschelling-German Bight TSS and the Precautionary Area.

Caution.—Within the waters in the vicinity of the outer pilot boarding station, vessels should navigate with caution, having special regard for those vessels restricted in their ability to maneuver or constrained by their draft or size.

Large vessels approaching the Jade are often escorted through outer approaches by Wasserschutzpolizei (marine police) craft, which exhibit a blue flashing light.

Several spoil ground areas lie in the approaches to the estuary and may best be seen on the chart.

Numerous wrecks lie in the approaches to the estuary and may best be seen on the chart.

Due to the constant changes in depths within the approach channels, the navigational aids are frequently moved.

Several National Park Wildlife Sanctuaries, the limits of which are shown on the chart, are situated along the banks of the rivers and adjacent to the estuary. Entry into these areas is restricted.

The River Jade

8.22 The fairway leading to Wilhelmshaven is entered N of Wangerooge and leads E and S to its termination in the bay known as Jade Busen. The islands of Wangerooge and Minsener Oog and the coast of Jeverland lie on the W side of this fairway. On the E side of the fairway and separating it from the Weser is the island of Alte Mellum and the peninsula of Butjadingen, between which is an extensive drying flat known as Hohe Weg.

The River Jade is divided into three parts known as the Aussenjade, Innenjade, and the Jade Busen.

Aussenjade is that part of the river which lies between the entrance and Schillig Reede, the roadstead situated off the NE point of Jeverland. There are two entrance channels in Aussenjade; the principal one is Wangerooger Fahrwasser, which with Oldoogrinne, its continuation, leads into Schillig Reede. The other channel is Mittel Rinne, which is used by coastal vessels with local knowledge.

Innenjade is comprised of Schillig Reede and the waterway S to abreast the port of Wilhelmshaven. Southward of this roadstead, the navigable waters of the Innenjade are not as wide, but still have substantial depths. The drying banks and shoals on both sides of Innenjade are generally steep-to.

Jade Busen, the large bay lying S of Wilhelmshaven, is occupied mainly by drying flats, but has a narrow channel which reaches into its central part. Varel, the only place of any importance within this bay, has a small harbor which is used by small craft and fishing boats.

The islands and other dangers which lie adjacent to the various reaches of the fairway are marked by lighted buoys and beacons. During the winter, when ice is expected, these lighted buoys are often replaced by unlighted buoys.

The main fairways within the Jade are marked by lighted buoys and are indicated by lighted ranges and leading lines which may best be seen on the chart. In addition, radar lines, which may best be seen on the chart, indicate the center of each fairway.

8.23 **Wangerooger Fahrwasser** (53˚49'N., 7˚57'E.), the main entrance channel, is entered 5 miles NNW of the W end of Wangerooge and leads in a general ESE direction between the shorebank fronting Wangerooge, and the middle grounds of Wangerooger Plate and Strand Plate. To the N of Minsener Oog, this channel turns SE and joins Oldoogrinne.

Oldoogrinne, in which the fairway becomes considerably wider, lies between the E side of Minsener Oog and Oldoogplate, another middle ground.

The projected dredged depths through Wangerooger Fahrwasser and Oldoogrinne are 20.1 to 19.4m, respectively.

Minsener Oog (53˚46'N., 8˚01'E.), an island of sand and an extended sand bar, which often dries, lies on the S side of the channel, 1.5 miles E of Wangerooge. A series of groins and embankments extend in various directions from the island and serve to divert the tidal currents. The groins Buhne A, Buhne B, and Buhne C extend from the N and E sides of the island towards the channel.

Minsener Oog Tower (53˚47'N., 8˚00'E.), a disused light structure, stands at the N head of Buhne A. It is square, 17m high, and prominent.

Oldoog Radar Tower stands near the root of Buhne C, 2 miles SSE of Minsener Oog Tower, and a refuge hut on piles is situated adjacent to it. The tower is 53m high and prominent.

Schillig Old Light Tower (53˚42'N., 8˚01'E.) stands 3.3 miles S of Oldoog Radar Tower. It is 35m high and prominent. A disused light structure is situated near the shore, 0.3 mile SE of this tower. It consists of a framework tower, 16m high.

Schillig Old Light Tower

Mittel Rinne (53˚49'N., 8˚00'E.), a narrow channel, leads between Wangerooger Plate and Strand Plate, on the W side, and Jade Plate and Oldoogplate, on the E side. It then joins the main fairway. This alternate entrance channel may be used by vessels with drafts of less than 6m.

Die Innenjade (53˚40'N., 8˚05'E.), consisting of three reaches, extends S for 14 miles from the vicinity of the S end of Minsener Ooog to the port of Wilhelmshaven. The N reach passes through Schillig Reede; the middle reach passes through the central part of the Innenjade; and the S reach then leads through the roadstead lying off Wilhelmshaven to the entrance into Jade Busen.

The projected dredged depths of the fairways through Die Innenjade are 19.4 to 18m.

Hooksiel Plate (53˚39'N., 8˚09'E.), which consists of several shoals with a least depth of 3.5m, lies on the E side of the channel, 3 miles S of Alte Mellum.

Hooksielplate Radar Tower (53˚40'N., 8˚09'E.) is 55m high and prominent. It is connected at the E side to a helicopter platform.

Genius Bank (53˚36'N., 8˚09'E.), long and narrow, has a least depth of 3.8m and lies on the W side of the channel, 2.5 miles S of Hooksiel Plate.

Hooksiel (53˚38'N., 8˚02'E.), a small harbor and yacht center, is entered through a lock situated on the W side of the river, 2.8 miles SW of Hooksielplate Radar Tower. The lock is 70m long and 8m wide.

A prominent mast, 131m high, stands 1.8 miles SW of the lock at Hooksiel. A number of wind generators, the tallest being 92m high, are situated in the vicinity of this mast. Two conspicuous chimneys, 202m high, stands near a refinery, 1.8 miles S of the lock at Hooksiel.

A conspicuous chimney, 275m high, stands at a power station located 2.2 miles NNW of the harbor locks at Wilhelmshaven.

On the E side of the river, prominent churches stand at Eckwarden and Langwarden, situated 3.7 miles E and 6.2 miles NE, respectively, of the locks at Wilhelmshaven.

A conspicuous radar tower, 43m high, stands at Tossens, 4 miles NE of the locks at Wilhelmshaven.

A conspicuous radar tower, 115m high, stands 1 mile SSW of the locks at Wilhelmshaven, on the S side of the wet dock.

Arngast Light (53˚29'N., 8˚11'E.) is shown from a prominent tower, 36m high with two galleries, standing 3 miles SSE of the locks at Wilhelmshaven.

Tides—Currents.—In the entrance to Wangerooger Fahrwasser, the tide rises about 4m at springs and 2.8m at neaps.

In Wangerooger Fahrwasser, the incoming current generally follows the direction of the channel. Abreast the E end of Wangerooge, a branch of this current sets S between Wangerooge and Minsener Oog, but the main current continues ESE into Oldoogrinne.

In Oldoogrinne, the incoming current is diverted to a SSE direction by Buhne A (the northernmost of the groins on Minsener Oog) and then to a S direction by Buhne B.

In the SE part of Wangerooger Fahrwasser, the incoming current may set vessels towards the S side of the fairway; in Oldoogrinne, vessels may be set towards the E side of the fairway.

The outgoing current generally sets in the opposite directions.

In Wangerooger Fahrwasser, abreast the E end of Wangerooge, the incoming current begins to set at 5 hours 15 minutes after HW at Wilhelmshaven (the reference station). It attains rates up to 3.3 knots at springs and 3 knots at neaps.

The outgoing current begins to set 1 hour 15 minutes before HW. It attains rates up to 2.5 knots at springs and 2 knots at neaps.

During W to NW gales, there are heavy ground swells in Wangerooger Fahrwasser, particularly with an outgoing current and at LW. During strong to gale winds, especially from a WNW direction, and with an outgoing current, there are rough, confused seas in the turn of the channel N and NE of Buhne A.

In the fairway through Schillig Reede, the incoming and outgoing currents attain maximum rates of 3 knots at springs and 2.5 knots at neaps. To the S of Schillig Reede, the currents follow more or less the direction of the fairways at slightly reduced rates.

Regulations.—Traffic Control.—See Regulations (paragraph 8.4) and Traffic Control (paragraph 8.5) under Approach Routes to the German Bight for information concerning the Vessel Traffic Service (VTS) system applying to vessels navigating within the approaches to German Bight and proceeding to the River Ems, the River Jade, the River Weser, or the River Elbe.

A local Vessel Traffic Service (VTS) system operates in the River Jade and is mandatory for the following:

1. Vessels over 50m in length, including towed or pushed composite units.
2. Vessels carrying dangerous cargo (gas, chemicals, petroleum, or petroleum products) in bulk.
3. Vessels carrying dangerous cargo (gas, chemicals, petroleum, or petroleum products) in bulk. Unloaded tankers if not cleaned, degassed, or completely inerted after carrying petroleum or petroleum products with a flashpoint below 35 C.
4. Nuclear-powered vessels.

Vessels entering the VTS area must maintain a continuous listening watch on VHF channel 16 or the local VHF channel of VTS Center Jade Traffic, as follows:

1. From 1b/Jade 1 Lighted Buoy to Nos. 33/34 Lighted Buoys (including vessels entering the VTS area from inland waterways)—VHF channel 63.
2. From Nos. 33/34 Lighted Buoys to No. 58 Lighted Buoy—VHF channel 20.

Vessels must send mandatory reports, as follows:

1. Sailing Plan (SP)—An SP must be sent to VTS Center Jade Traffic on VHF channel 63 or 20, as appropriate to the VTS area, if not already reported by an SP to VTS Center German Bight, as follows:
   a. Before entering the local VTS area from sea.
   b. Before entering the VTS area from a harbor or berth within the VTS area.
2. Deviation Report (PR) or Incident Report (IR)—DR and IR reports must be sent as necessary to VTS Center Jade Traffic on VHF channel 63 or 20, as appropriate to the VTS area.

The format for the SP can be found in Traffic Control (paragraph 8.5) under Approach Routes to the German Bight

Radar advice is provided on request or if instructed by VTS Center Jade Traffic (in German, or on request, in English). The request should include the vessel's name, call sign, and position for identification.

This service is provided when the visibility is less than 3,000m; when the pilot vessel is in a sheltered position; when lighted buoys are withdrawn due to ice; when required by the traffic situation: or when requested by a vessel.

The radar stations, VHF channels, and respective areas are, as follows:

1. Jade Radar I—VHF channel 63—From 1b/Jade 1 Lighted Buoy to Nos. 33/34 Lighted Buoys.
2. Jade Radar II—VHF channel 20—From Nos. 33/34 Lighted Buoys to No. 58 Lighted Buoy.

The VTS Center Jade Traffic broadcasts information (weather, traffic, dredging, and depths) on request and at 10 minutes after the hour on VHF channel 63 and 20, in German.

Regulations—General.—Large tankers bound for the River Jade are escorted through the Jade Approach TSS by Water Police patrol vessels, which display blue flashing lights.

Extraordinarily Large Vessels on the Jade are defined as those exceeding 350m in length, 52m beam, and 20m draft inbound or 19m draft outbound. Such vessels are tide dependent and entry is allowed only if the maintained projected depths exist.

All Extraordinarily Large Vessels, high speed vessels, air cushion vehicles, and unusually large tug formations must obtain permission from the Water Police Authority at Wilhelmshaven immediately prior to entering the Jade.

On specified fairway sections of the River Jade there are prohibitions on meeting or overtaking other vessels. These prohibitions apply to vessels carrying liquid gases, vessels over 250m in length or 13.5m draft, and unusual tug formations. In order to enforce the regulations, Jade VTS co-ordinates the movements of all vessels.

Oil, gas, and chemical tankers (including towed units), which are carrying hazardous goods in bulk or have done so but are not certified gas-free, are permitted to enter the Jade only when the visibility is 1,000m or more. In special circumstances, when the visibility is 500m to 1,000m, such vessels may enter with permission of the Jade VTS.

All vessels with drafts over 16.5m are tide dependent and are required to follow a predetermined entry plan.

Anchorage.—For anchorages in the outer approaches, see the River Jade and the River Weser Estuary (paragraph 8.21).

An anchorage area for tankers not exceeding 250,000 dwt and/or 13.5m draft lies on the E side of the fairway, about 3.2 miles NNE of Schillig Old Light Tower (53˚42'N., 8˚01'E.).

An anchorage area for general cargo vessels, with drafts up to 13.5m, lies on the E side of the fairway, about 2.3 miles NE of Schillig Old Light Tower (53˚42'N., 8˚01'E.).

An explosives anchorage area lies on the W side of the fairway, about 1.5 miles E of Schillig Old Light Tower (53˚42'N., 8˚01'E.). If unoccupied, this area may be used by vessels carrying gas or inflammable liquids.

A quarantine anchorage area lies on the W side of the fairway, about 1.5 miles ENE of Schillig Old Light Tower (53˚42'N., 8˚01'E.). If unoccupied, this area may be used by vessels carrying gas or inflammable liquids.

Anchorage areas for tankers lie on the E side of the fairway, 3 miles SSE of Hooksielplate Radar Tower (53˚40'N., 8˚09'E.) and 0.5 mile E of the entrance to Neuer Vorhaven.

Wilhelmshaven Reede, a general anchorage area, lies on the E side of the fairway, 0.9 mile SSE of the entrance to Neuer Vorhaven.

The limits of the above anchorage areas are marked by buoys and may best be seen on the chart.

Caution.—A seaplane landing area, which may best be seen on the chart, lies on the W side of the fairway, about 2 miles ESE of Shillig Old Light Tower (53˚42'N., 8˚01'E.). It is reported to be only used occasionally.

A former ammunition dumping ground area lies on the E side of the fairway, close W of Hooksielplate Radar Tower (53˚40'N., 8˚09'E.) and may best be seen on the chart.

Wilhelmshaven (53˚32'N., 8˚10'E.)

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8.24 Wilhelmshaven is located on the W bank of the Innenjade, at the entrance to the Jade Busen. The harbor consists of a complex of wet basins, which are entered through two locks, and several tidal berths situated along the W side of the channel. The port is also a naval base.

Tides—Currents.—The tides rise about 4.3m at springs and 3.7m at neaps.

Off the harbor entrance, the incoming current generally begins 6 hours before HW at Wilhelmshaven, sets in a 230˚ direction, and attains a maximum strength of 1.8 knots at springs. The outgoing current begins 15 minutes before HW, sets in a 065˚ direction, and attains a maximum strength of 1.5 knots at springs. It has been reported that currents up to 4 knots have been experienced off the Nord-West Oelleitung Terminal.

Depths—Limitations.—A dredged channel leads from the main river fairway into Neuer Vorhaven, an outer basin, and extends to the entrance of Inner Harbor, the wet dock complex. It is 200m wide and has a dredged depth of 8m. The berths within Neuer Vorhaven are reserved for naval vessels.

Two lock chambers, situated side by side, provide entry to the wet dock complex. The chambers, equipped with sliding gates, are 350m long, 57m wide, and have depths of 11.47m over the outer sill. Vessels up to 11.5m draft can enter at HW.

The main facilities within the Inner Harbor include the following:

1. Ausrustungshafen is a basin used for laying up vessels. It has a depth of 10m and can accommodate vessels up to 20,000 dwt at two dolphin berths.
2. Nordhafen, a basin entered from the locks, provides 785m of total berthage, with a depth of 10m alongside.
3. Verbindungshafen, a basin, provides 720m of total berthage, with depths of 7 to 12m alongside.
4. Grosser Hafen, a basin, provides 500m of total berthage, with depths of 6 to 10m alongside.
5. Handelshafen, a basin, provides 980m of total berthage, with depths of 4 to 5m alongside.
6. Kanalhafen, a basin, provides 600m of total berthage, with depths of 4 to 5m alongside.

Grosser Hafen provides access to the Ems-Jade Kanal via a lock which is 50m long and 7.5m wide. The canal leads to Emden, with a connection to the Dortmund-Ems Kanal, and is used by small craft and barges.

The Outer Harbor consists of the following river facilities:

1. The ICI Terminal, situated 6 miles NNW of the entrance to the Inner Harbor, is formed by an L-shaped jetty extending 1,346m from the shore with a pier, 675m long. Vessels up to 12,000 dwt, 137m in length, and 9m draft can be accommodated alongside the inner berth. It is reported (2002) that the seaward berth is presently not operational.
2. The WRG Refinery Terminal, situated 5 miles NNW of the entrance to the Inner Harbor, is formed by an L-shaped jetty and a sea island pier. The main jetty berth has a depth of 7.5m alongside and can accommodate tanker vessels up to 8,000 dwt and 6.5m draft. The sea island pier main berth has a depth of 17m alongside and can accommodate tankers up to 250,000 dwt, 350m in length, and 16.5m draft.
3. The Niedersachsenbrucke Bulk Terminal, situated 2.5 miles NNW of the entrance to the Inner Harbor, is formed by an L-shaped jetty with two berths, each 300m long. The main outer berth has a depth of 15m alongside and can accommodate vessels up to 190,000 dwt and 14.3m draft.
4. The Nord-West Oelleitung Terminal, situated 1 mile NNW of the entrance to the Inner Harbor, is formed by a T-head pier which has depths of 19 to 21.5m alongside. Vessels up to 260,000 dwt and 20m draft can be accommodated. It is reported (2000) that a partly laden vessel of 413,000 dwt, 366m in length, 70m beam, and 18.7m draft has been handled at this terminal.

Generally, vessels navigating the River Jade should have an underkeel clearance of at least 8.5 per cent of draft. Vessels

entering the river are limited to a draft of 20m and vessels departing are limited to a draft of 19m. In addition, vessels navigating the river with a length of over 350m or a beam of over 52m must apply for a special permission.

Pilotage.—See Pilotage under The River Jade and The River Weser Estuary (paragraph 8.21).

8.25 **Jade Busen** (53˚28'N., 8˚12'E.), the large bay lying S of Wilhelmshaven, is for the most part obstructed by drying shoals, flats, and banks. The small harbor at Varel, 6.5 miles above Wilhelmshaven, is the only place of any commercial importance and the River Jade proper discharges into the bay near the entrance to this harbor.

Vareler Fahrwasser, a fairly deep channel, passes along the E side of Schweinsrucken, an extensive bank, and leads S to join Vareler Tief, a shallow channel, which continues to the harbor at Varel. There are depths in the entrance channel of less than 0.9m, but at HW, small vessels, with drafts up to 3m, can use it. The harbor is entered through a lock and is used by fishing vessels and small coasters. Several marinas are situated along the shores of Jade Busen.

The River Weser

8.26 That part of the River Weser, from its entrance to the port of Bremerhaven, a distance of about 32 miles, is known as the Aussenweser. From Bremerhaven to Bremen, it is known as the Unterweser. The distances from the seaward entrance to Nordenham (53˚29'N., 8˚29'E.) and Bremen are about 38 miles and 64 miles, respectively.

There are two entrance channels leading into the River Weser; Neue Weser and Alte Weser are entered 5.7 miles NNE and 9 miles NE, respectively, of the W end of Wangerooge. Roter Sand and Roter Grund, two large and irregularly shaped shoal banks, lie between these two entrance channels.

To the SE of Roter Grund and in the vicinity of Tegeler Plate Light (53˚48'N., 8˚11'E.), the two entrance channels unite and form one main channel. Sections of this main channel are known as Hoheweg Rinne, Fedderwarder Fahrwasser, and Wremer Loch. Both sides of the channel are bordered by steep-to shoals and sandbanks, some of which dry up to 2.1m. Numerous training walls and groins have been erected on both sides of the waterway, particularly in the inner part of the Aussenweser.

On the W and S sides of the waterway are the extensive shoal areas of Mellum Plate, Hohe Weg, and Langlutjen Sand; the former two areas separate the Weser from the Jade and the latter area fronts the low and diked NE coast of Butjadingen.

On the E and N sides of the waterway is a large shorebank, which fronts the low and diked coast stretching between Bremerhaven and Cuxhaven. This bank terminates at its seaward end in Norder Grunde and Scharhorn Riff. Tegeler Plate and Robben Plate are the principal drying banks on this side of the waterway and both of these banks are joined by shoals. In addition, shoals extend NW from Tegeler Plate, the outer drying bank, and SE from Robben Plate.

Shallow channels lead across the large shoal bank between the River Weser and the River Elbe; however, they are only used by small vessels and fishing boats with local knowledge. A channel, accessible from seaward, is entered between Norder Grunde and Scharhorn Riff and follows a rather circuitous course to the small harbor on the island of Neuwerk.

The Hunte River, a tributary of the River Weser, is entered 4.5 miles above Brake and leads to the small ports of Elsfleth and Oldenburg.

The islands and other dangers, which lie adjacent to the various reaches of the fairway, are well-marked by lighted buoys and beacons. During the winter, when ice is expected, these lighted buoys are often replaced by unlighted buoys.

The main fairways within the River Weser are marked by lighted buoys and indicated by lighted ranges and sectors which may best be seen on the chart. In addition, radar lines, which may best be seen on the chart, indicate the center of each fairway.

8.27 **Neue Weser** (53˚52'N., 7˚52'E.), the principal entrance channel leading into the Aussenweser, is entered about 4 miles E of Jade 2 Lighted Buoy (53˚52'N., 7˚47'E.). The channel leads ESE and SE between Jade Plate, on the S side, and Roter Grund, on the N side.

The fairway in this channel has a projected dredged depth of 13.9m.

Alte Weser (53˚55'N., 7˚58'E.), the secondary entrance channel leading into the Aussenweser, is entered about 9 miles NW of Alte Weser Light (53˚52'N., 8˚08'E.). This channel leads SE and S to a position located NW of Tegeler Plate Light (53˚48'N., 8˚11'E.), where it joins the main channel. It crosses a sand bar extending SE from Roter Grund. The entrance to this channel is marked by Schlusseltonne Lighted Buoy (53˚56'N., 7˚55'E.).

The fairway in this channel has a least depth of 9m (2002), but is not maintained by dredging.

Hohewegrinne, a main channel, leads inward and SE for 6.5 miles from the junction of the Neue Weser and Alte Weser. Fedderwarder Fahrwass and Wremerloch, two main channels, then lead inward to Bremerhaven.

The main fairways in the river have projected dredged depths of 13.9m as far as Bremerhaven, 11m as far as Nordenham, and 9m as far as Bremen.

On normal tides, vessels, at HW, can reach Bremerhaven, with drafts up to 14.5m (fresh water); Nordenham, with drafts up to 13m; Brake, with drafts up to 11.3m; and Bremen, with drafts up to 10.7m (2002).

Hohe Weg Light (53˚43'N., 8˚15'E.), a main directional light, is shown from a prominent tower standing on the W side of the channel. The tower is 36m high and surmounted by a radar scanner.

Robben Radar Tower (53˚40'N., 8˚26'E.) stands on the E side of the river. It is 52m high and prominent.

Several conspicuous container gantry cranes stand in the vicinity of the Stromkaje Quay river berths at Bremerhaven.

A conspicuous radio tower, 112m high, stands on the E side of the river at Bremerhaven, on the N side of the entrance to the River Geeste.

Weddewarden Airport Aero Light (53˚35'N., 8˚34'E.) is shown from a prominent framework tower, 77m high, standing close N of the wet docks at Bremerhaven.

A prominent chimney, 153m high, stands on the W side of the river at a factory, 1 mile WSW of the entrance to the River

Hohe Weg Light

Geeste. A prominent radar tower, 52m high, stands on a ruined fort, 2 miles NW of the chimney.

Esenshamm Nuclear Power Station (53˚26'N., 8˚29'E.), with a conspicuous chimney 101m high, stands on the W side of the river.

Farge Power Station (53˚12'N., 8˚31'E.), with a conspicuous chimney, stands on the E side of the river. Two prominent pylons, which support an overhead cable, are situated on each side of the river, close NW of the power station.

Bremen Harbor Power Station (53˚08'N., 8˚44'E.) stands on the N side of the river. Its chimney, the tallest in the port, is 250m high and conspicuous.

Tides—Currents.—In the vicinity of Roter Sand Disused Light Tower (53˚51'N., 8˚05'E.), the tide rises about 3m at springs and 2.9m at neaps.

Winds from between the WNW and NNW generally raise the water level, and winds from a SE direction lower it.

The tidal currents in the river do not always follow the bed of the channel, but tend to set along one side of the main channel. The depths in the various reaches of the main channel and the limits and shapes of the numerous sandbanks are frequently changed by these currents, at times quite considerably.

In a position about 1.2 miles S of Roter Sand Disused Light Tower, the incoming SE current begins to set at about 6 hours after HW at Bremerhaven (the reference station) and attains a maximum rate of 2.3 knots at springs and 1.5 knots at neaps. The outgoing NW current begins to set a short while before HW and attains a maximum rate of about 2.3 knots at springs and 1.8 knots at neaps.

In a position off the NW end of the shoals extending from Tegeler Plate, the currents set E and W and attain rates of 2 knots. During strong N winds, heavy surf often forms on Tegeler Plate, particularly at LW.

In a position abreast the middle of Robben Plate, the incoming current begins to set 5 hours 15 minutes before HW and attains a maximum rate of 3 knots at springs. The outgoing current begins to set at about the time of HW and attains a maximum rate of 4 knots at springs.

During W to NW gales, there are heavy ground swells in the outer part of Neue Weser, particularly with an outgoing current and at LW.

Regulations.—Traffic Control.—See Traffic Control (paragraph 8.5) under Approach Routes to the German Bight for information concerning the Vessel Traffic Service (VTS) system applying to vessels navigating within the approaches to the German Bight and proceeding to the River Ems, the River Jade, the River Weser, or the River Elbe.

A local Vessel Traffic Service (VTS) system operates in the Weser and is mandatory for the following:

1. Vessels over 50m in length, including towed or pushed composite units.
2. Vessels carrying dangerous cargo (gas, chemicals, petroleum, or petroleum products) in bulk.
3. Unloaded tankers if not cleaned, degassed, or completely inerted after carrying petroleum or petroleum products with a flashpoint below 35 C.
4. Nuclear-powered vessels.

The Weser VTS is divided into three operating areas—Bremerhaven Weser Traffic, Bremen Weser Traffic, and Hunte Traffic.

Vessels entering the VTS area of Bremerhaven Weser Traffic must maintain a continuous listening watch on the local VHF channel of VTS Center Bremerhaven Weser Traffic or on VHF channel 16, as follows:

1. From No. 3a/Neue Weser Reede Lighted Buoy to No. 19/H Reede Lighted Buoy (inbound only) (Neue Weser)—VHF channel 22.
2. From No. 19/H Reede Lighted Buoy to No. 4a Lighted Buoy (outbound only) (Neue Weser)—VHF channel 22.
3. From A1 Lighted Buoy to No. 16a/A16 Lighted Buoy (inbound only) (Alte Weser)—VHF channel 22.
4. From No 16a/A16 Lighted Buoy to No. 2 Lighted Buoy (outbound only) (Alte Weser)—VHF channel 22.
5. From No. 19/H Reede Lighted Buoy to No. 37 Lighted Buoy—VHF channel 2.
6. From No. 37 Lighted Buoy to No. 5 Buoy—VHF channel 4.
7. From No. 53 Buoy to No. 63 Lighted Buoy—VHF channel 7.
8. From No. 63 Lighted Buoy to No. 58 Lighted Buoy—VHF channel 5.
9. From No. 58 Lighted Buoy to No. 79 Lighted Buoy—VHF channel 82.
10. From No. 79 Lighted Buoy to No. 93 Buoy (Kaseburg)—VHF channel 21.

Vessels must send mandatory reports, as follows:

1. Sailing Plan (SP)—An SP must be sent to VTS Center Bremerhaven Weser Traffic on the appropriate VHF channel, if not already reported by an SP to an adjacent VTS center, as follows:
   a. Before entering the VTS area of Bremerhaven Weser from sea.
   b. Before entering the VTS area of Bremerhaven Weser from a harbor or berth within the VTS area.
2. Position Report (PR)—A PR must be sent to VTS Center Bremerhaven Weser Traffic on the appropriate VHF channel when entering the VTS area, when leaving a harbor

or berth, and when passing the following reporting points (RP):

a. RP 1A—No. 3a/Neue Weser Reede Lighted Buoy (Neue Weser)—VHF channel 22.

b. RP 1B—The A1 Lighted Buoy (Alte Weser) (inbound only)—VHF channel 22.

c. RP 2—Bremerhaven Front Light (outbound only)—VHF channel 7.

d. RP 3—No. 56 Blexen-Reede Lighted Buoy (outbound only)—VHF channel 5.

e. RP 4—No. 93 Buoy (Kaseburg) (outbound only)—VHF channel 21.

Note.—Outbound vessels must report to German Bight Traffic on VHF channel 80 on passing No. 4a Lighted Buoy (Neue Weser) or A2 Lighted Buoy (Alte Weser).

Vessels entering the VTS area of Bremen Weser Traffic must maintain a continuous listening watch on the local VHF channel of VTS Center Bremen Weser Traffic or on VHF channel 16, as follows:

1. From No. 93 Buoy (Kaseburg) to No. 113 Buoy—VHF channel 19.

2. From Hunte Entrance to Elsfleth (Km 24.3)—VHF channel 19.

3. From No. 113 Buoy to Lemwerder Airfield (Km 15)—VHF channel 78.

4. From Lemwerder Airfield (Km 15) to Bremen Railway Bridge (Km 1.5)—VHF channel 81.

Vessels must send mandatory reports ,as follows:

1. Sailing Plan (SP)—An SP must be sent to VTS Center Bremen Weser Traffic on the appropriate VHF channel, if not already reported by an SP to an adjacent VTS center, before entering the VTS area of Bremen Weser Traffic from a harbor or berth within the VTS area.

2. Position Report (PR)—A PR must be sent to VTS Center Bremen Weser Traffic on the appropriate VHF channel when entering the VTS area of Bremen Weser Traffic, when leaving a harbor or berth, and when passing the following reporting points (RP):

a. RP 1—No. 93 Buoy, Kaseburg (inbound only)—VHF channel 19.

b. RP 2— Entrance to Hunte—VHF channel 19.

c. RP 3—Elsfleth Nautical School (Km 24.3) (outbound only)—channel 19.

d. RP 4—No. 111 Buoy, Farge—VHF channel 19.

e. RP 5—Moorlosen Church (Km 12.5)—VHF channel 81.

f. RP 6—Bremen Railway Bridge (Km 1.5)—VHF channel 81.

Vessels entering the VTS area of Hunte Traffic, from Elsfleth (Km 23.2) to Oldenburg-Drielake (Km 1.8), must maintain a continuous listening watch on VHF channel 63 or 16.

Vessels are also required to maintain a listening watch on VHF channel 73 during the voyage on the Hunte. Vessels are recommended to give position reports on VHF channel 73, stating the vessel's name and direction of travel, before passing restricted areas and opening bridges, as well as before passing narrows in channels or bends which cannot be seen.

Vessels must send mandatory reports, as follows:

1. Sailing Plan (SP)—An SP must be sent to VTS Center Hunte Traffic on VHF channel 63, if not already reported by an SP to an adjacent VTS center, before entering the VTS area of Hunte Traffic from a harbor or berth.

2. Position Report (PR)—A PR must be sent to VTS Center Hunte Traffic on VHF channel 63 when entering the VTS area of Hunte Traffic, when leaving a harbor or berth, and when passing the following reporting points (RP):

a. RP 1—Elsfleth (Km 24.3) (inbound only)—VHF channel 63.

b. RP 2—Oldenburg-Drielake (Km 1.0)—VHF channel 63.

Vessels over 160m in length must obtain information on the traffic situation and developments in this area from Bremen Weser Traffic 2 hours before entering the mouth of the Hunte.

Deviation Reports (DR) or Incident Reports (IR) must be sent as necessary to the appropriate VTS center.

The format for the SP and RP can be found in Traffic Control (paragraph 8.5) under Approach Routes to the German Bight.

Radar advice is provided on request or if instructed by the VTS Center (in German, or on request, in English). The request should include the vessel's name, call sign, and position for identification.

This service is provided when the visibility is less than 3,000m by Bremerhaven Weser (2,000m by Bremen Weser); when the pilot vessel is in a sheltered position; when lighted buoys are withdrawn due to ice; when required by the traffic situation: or when requested by a vessel.

The radar stations, VHF channels, and respective areas in the approaches and entrance are, as follows:

1. Alte Weser Radar—VHF channel 22—No. 3a/Neue Weser Reede Lighted Buoy (Neue Weser) to No. 19H/Reede Lighted Buoy and A1 Lighted Buoy (Alte Weser) to No. 16a/A16 Lighted Buoy.

2. Hohe Weg Radar I—VHF channel 2—No. 21 Lighted Buoy to No. 27 Lighted Buoy.

3. Hohe Weg Radar II—VHF channel 2—No. 27 Lighted Buoy to No. 37 Lighted Buoy.

4. Robbenplate Radar I—VHF channel 4—No. 37 Lighted Buoy to No. 47 Lighted Buoy.

5. Robbenplate Radar II—VHF channel 4—No. 47 Lighted Buoy to No. 53 Lighted Buoy.

Bremerhaven Weser Traffic broadcasts navigational and meteorological information (in German) at 20 minutes past every hour on VHF channels 2, 4, 5, 7, 21, 22, and 82.

Bemen Weser Traffic broadcasts navigational and meteorological information (in German) at 30 minutes past every hour on VHF channels 19, 78, and 81.

Hunte Weser Traffic broadcasts navigational and meteorological information (in German) at 30 minutes past every hour on VHF channel 63.

Regulations—General.—Extraordinarily Large Vessels on the Weser are defined as those exceeding 350m in length and 14.5m fresh water draft transiting from sea to Bremerhaven; those exceeding 13m fresh water draft transiting between Bremerhaven and Nordenham; those exceeding 11.9m fresh water draft inbound, or 11.6m outbound, transiting between Nordenham and Brake; and those exceeding 190m in length or 6.05m fresh water draft transiting between Brake and Bremen. Such vessels are tide dependent and entry is allowed only if the maintained projected depths exist.

All Extraordinarily Large Vessels, high speed vessels, air cushion vehicles, and unusually large tug formations must obtain permission from the Water Police Authority at Bremerhaven immediately prior to entering the Weser.

Oil, gas, and chemical tankers (including towed units), which are carrying hazardous goods in bulk or have done so but are not certified gas-free, are permitted to enter the Weser only when the visibility is 1,000m or more. In special circumstances, when the visibility is 500m to 1,000m, such vessels may enter with permission of the Weser VTS.

Deep-draft right-of-way vessels, which are constrained by the tide (see paragraph 8.4), are prohibited from meeting or overtaking between Buoy No. 39 (53˚40'N., 8˚23'E.) and No. 43 Lighted Buoy (53˚38'N., 8˚25'E.) and in the vicinity of the bend in the channel adjacent to Bremerhaven.

Deep-draft right-of-way vessels, which intend to enter Nordschleuse, the northernmost lock at Bremerhaven, may receive permission to navigate on the port side of the fairway in an area extending up to about 1.8 miles N of the lock. Such vessels must remain on the port side until they have entered the lock approach basin. Other vessels proceeding N must allow these vessels to pass on their starboard side.

Vessels with a combined width of 65m or more and, in visibility of less than 1,000m, vessels over 140m in length may not pass each other between the mouth of the Hunte River and the entrance to Neustadterhafen (Bremen).

Anchorage.—For anchorages in the outer approaches, see the River Jade and the River Weser Estuary (paragraph 8.21).

Hoheweg Reede, a general anchorage area, with depths of 13 to 17m, lies on the SW side of the fairway, about 1.7 miles NE of Mellumplate Light (53˚46'N., 8˚06'E.).

Fedderwarden Reede, an anchorage area for laden tankers (excluding gas carriers) and vessels carrying explosives, lies on the SW side of the fairway, about 0.8 mile NE of Hohe Weg Light (53˚43'N., 8˚15'E.).

Blexen Reede (53˚31'N., 8˚33'E.) lies at the SE side of the fairway. This anchorage area is divided into three parts for general cargo vessels, tankers and vessels carrying explosives, and small craft.

Nordenham Reede (53˚29'N., 8˚29'E.), a designated anchorage area, lies at the E side of the fairway.

The limits of the above anchorage areas are marked by buoys and may best be seen on the chart.

Caution.—Due to silting, the depths in the fairways of the river are subject to constant change and charted depths cannot always be relied on. Consequently, the navigational aids are frequently shifted to reflect these changes. The authorities should always be contacted to ascertain the latest depths in the fairways.

In addition, the ranges indicating the fairways of the various reaches do not always mark the exact middle of the channel. They should be interpreted freely in order that vessels remain mostly to the right side of the channel; in some places, the fairways are quite narrow and, for this reason, strict attention should be given to oncoming traffic.

Underwater obstructions exist on the sand banks and flats lying outside of the buoyed fairways.

Several submarine cables lie within the river and may best be seen on the chart.

Ferries cross the river at several points which are indicated on the chart.

Although returns from the coast of Wangerooge are good, the use of radar in the close approaches to and within Aussenweser requires local knowledge due to the irregular returns formed by sandbanks, breakers, and tide-rips.

Overhead power cables, with a vertical clearance of 62m, span the river in the vicinity of Farge (53˚12'N., 8˚31'E.), at Km 26, and close W of Bremen, at Km 11.

Weser Tunnel (53˚26'N., 8˚30'E.) passes under the river near Kleinensiel at Km 53. Anchoring is prohibited in the vicinity of the tunnel and deep-draft vessels must reduce speed when passing over it.

Bremerhaven (53˚32'N., 8˚35'E.)

World Port Index No. 30810

8.28 The port of Bremerhaven is located on the E bank of the Weser and is divided into two parts by the Geeste River. The main commercial harbor lies N of the Geeste and consists of a complex of wet basins, which may be entered via two locks, and a number of riverside berths. South of the Geeste, there are a number of wet basins which may be entered through the mouth of the Geeste and via a double lock; these basins are used principally by an extensive fishing fleet.

Winds—Weather.—Winds from the W and SW predominate throughout the year and frequently reach gale force, but do not generally affect port operations. With continued strong E winds, sufficient water is sometimes withdrawn from the river so that vessels can only enter or depart at HW.

Tides—Currents.—The tide rises about 4m at springs and 3.6m at neaps.

The tidal current off the port begins to set inward at about 5 hours before local HW and attains a maximum rate of 2.3 knots at springs. The outgoing current begins about 45 minutes after local HW and attains a maximum rate of 3 knots at springs. The currents set diagonally across the port entrance and vessels are advised to guard against them.

Depths—Limitations.—The main river fairway has a least depth of 13.9m as far as the port.

The principal riverside facilities include Columbuskaje and Stromkaje. Columbuskaje, situated between the lock entrances, is 1,020m long and has a depth of 9.8m alongside. This quay is used principally by passenger and large ferry vessels.

Stromkaje, a container terminal quay, is situated close N of the entrance to Nordschleuse, the northernmost lock. It is 3,000m long and has a depth of 14.6m alongside.

The principal wet basin complex, located N of the Geeste River, is entered via two locks. The Nordschleuse lock is 372m long, 45m wide, and has a charted depth of 10.8m over the sill. It has a depth of 14.3m over the sill at MHW and can handle vessels with drafts up to 13m (fresh water).

Vessels up to 315m in length and 41m beam can use the Nordschleuse lock. The maximum draft for entry varies with the beam. Vessels with a maximum draft of 13m (fresh water) are limited to a beam of 38m. Vessels with a maximum beam of 41m are limited to a draft of 11.6m.

Kaiserschleuse, the S lock, is 223m long, 27m wide, and has a charted depth of 6.8m over the sill. It has a depth of 10.5m

over the sill at MHW and can handle vessels up to 185m in length, 25m beam, and 8.5m draft.

The main basins in the complex are described below.

Nordhafen, with facilities for ro-ro cars and containers, has 1,230m of total quayage, with a depth of 11m alongside.

Osthafen has 595m of total quayage, with a depth of 14m alongside.

Verbindungshafen has 1,290m of total quayage, with a depth of 10.8m alongside. Several shipyards, drydocks, and repair facilities are situated along the E side of this basin.

Kaiserhafen I has 2,010m of total berthage, with depths of 8.8 to 10.8m alongside.

Kaiserhafen II has 1,070m of total berthage, with a depth of 10.8m alongside.

Kaiserhafen III has 1,420m of total berthage, with a depth of 10.8m alongside.

Fischereihafen, the complex situated S of the Geeste River, has five wet basins and is accessible through two locks. The W lock is 106.5m long and 11.1m wide; and the E lock is 181m long and 32.5m wide. Both locks have a charted depth of 5.8m over the sill. Vessels up to 170m in length, 27m beam, and 7m draft can be handled. The complex provides 7,000m of total quayage, with depths of 5 to 7.5m alongside, and is used mostly by fishing vessels and coasters.

The port has facilities for general cargo, passenger, ferry, ro-ro, reefer, vehicle carrier, tanker, container, bulk, fishing, and LASH vessels. In addition, there are several drydocks, the largest being 335m long and 40m wide, which can handle vessels up to 110,000 dwt.

It is reported (2002) that vessels up to 350m in length and 14.5m draft (freshwater) can be accommodated at the riverside facilities at HW.

Bremerhaven—Stromkaje Terminal

Pilotage.—See Pilotage under The River Jade and The River Weser Estuary (paragraph 8.21).

Regulations.—Vessels berthed at the riverside facilities may display a red cylinder by day and show a red light vertically between two white lights at night as a warning to passing vessels to reduce speed.

Speed regulations are in force within the fairways located adjacent to Bremerhaven.

Bremerhaven—Nordschleuse (North Lock)

8.29 The **Geeste River** (53˚32'N., 8˚35'E.) meanders through the city of Bremerhaven and discharges, between two high moles, into the Weser. The entrance is 95m wide and has a dredged depth of 6m; however, the depths are usually reduced by considerable deposits of silt.

About 0.4 mile above the entrance, a flood barrage, spanned by a bascule bridge, crosses the river. The barrage is closed when the water level rises to 1m or more above MHW. The barrage provides a navigable width of 24m. The bridge has a vertical clearance of only 5.5m when closed.

Several swing bridges span the river above the flood barrage. The river is tidal as far as a lock, situated about 2.7 miles above the entrance, which connects with the inland waterway system.

Bremerhaven to Bremen

8.30 That part of the River Weser, between Bremerhaven and Bremen, a distance of 36 miles, is known as the Unterweser. The river flows through an area of shallow marshland and in places its direction is maintained by training walls and groins. Nordenham is situated 4 miles above Bremerhaven. Between Nordenham and Brake, a distance of 10 miles, several small towns stand along the banks of the river and are fronted by berthing facilities. However, these facilities are of little commercial importance and used only by small coastal vessels, inland craft, and pleasure boats.

The Hunte River flows into the W side of the River Weser, about 18 miles above Bremerhaven; the Lesum River flows into the E side of the Weser at Vegesack, 26 miles above Bremerhaven. The small harbors of Elsfeth and Oldenburg are situated on the Hunte River 2 and 14 miles, respectively, above its mouth.

The fairways in the various reaches of the Unterweser are marked by buoys and indicated by lighted ranges as far as Vegesack; above Vegesack, the channel is marked by successive pairs of lighted beacons standing on the river banks. In

addition, distances along the river are indicated on both sides by kilometer marks which commence near Bremen.

Tides—Currents.—The duration of the incoming tidal current becomes shorter the farther up the river it goes. It sets for 5 hours 45 minutes at Bremerhaven and only for 1 hour 45 minutes at Bremen. The duration of the outgoing current becomes longer. It sets for 8 hours 30 minutes at Bremen and only 6 hours 45 minutes at Bremerhaven.

Before the current begins to set outward, a SW period progresses upstream. There is no noticeable current for 40 minutes at Vegesack, but at Bremen, there is no noticeable current for 2 hours 15 minutes.

In addition, the maximum rate of the current is sustained for longer periods.

About 1 mile above Nordenham, the incoming current begins 4 hours 30 minutes before HW at Bremerhaven and attains a maximum rate of 3.2 knots at springs. The outgoing current begins 1 hour 15 minutes after HW and attains a maximum rate of 3.7 knots at springs.

Close below Brake, the incoming current begins at 3 hours 45 minutes before HW at Bremerhaven and attains a maximum rate of 1.8 knots at springs. The outgoing current begins at 1 hour 30 minutes after HW and attains a maximum rate of 2.7 knots at springs.

Depths—Limitations.—Vessels up to 270m in length are permitted to proceed upriver as far as Brake. Vessels are limited to a maximum length of 250m between Brake and Bremen.

Vessels over 230m in length may proceed above the mouth of the Hunte River only when the wind force is less than force 6 and visibility is more than 1,000m.

The projected dredged depths in the main fairway are 11m as far as Nordenham and 9m as far as Bremen, where they decrease rapidly.

Caution.—Numerous ferries cross the fairway at various places which are indicated on the chart.

Several submarine pipelines and cables lie across the fairways and may best be seen on the chart.

The Unterweser, like the Aussenweser, is subject to frequent changes in depths and the navigation aids are frequently moved accordingly.

8.31 Nordenham (53˚29'N., 8˚29'E.) (World Port Index No. 30840), an important bulk and chemical port, is located on the W bank of the river. The area along this bank between Blexen, located close above Bremerhaven, and Nordenham, 4 miles above Bremerhaven, is the site of numerous industrial plants. These installations are fronted by a number of quays and piers, some private, which form the port.

Tides—Currents.—The tide rises 4m at springs and 3.6m at neaps.

The water level at the port is greatly affected by strong winds. A rise of 0.9m and a fall of 0.6m may be expected during NW and E gales, respectively. The tidal currents off the port set at maximum rates of 2 knots on the flood and 3 knots on the ebb.

Depths—Limitations.—The fairway leading to the port has a dredged depth of 11m. The main quays and piers provide about 1,800m of total berthage with depths of 4 to 13.5m alongside. There are facilities for tanker, bulk, timber, and chemical vessels. Generally, vessels up to 270m in length and 13m draft can be handled at HW. Vessels up to 80,000 dwt and 125,000 dwt, partly laden, have been accommodated in the port.

8.32 Brake (53˚20'N., 8˚29'E.) (World Port Index No. 30850) is located on the W bank of the river, 47 miles above the entrance and about midway between Bremerhaven and Bremen.

Tides—Currents.—Tides rise about 4m at springs and 3.5m at neaps.

The water level off the port is affected by strong winds from the NW and SE and rises and falls of the water level up to 0.9m are not uncommon. The tidal currents here may attain rates up to 5 knots on the ebb and 3 knots on the flood.

Depths—Limitations.—The river fairway leading to the port has a projected dredged depth of 9m. The harbor consists of a wet dock complex and several riverside berths.

The lock providing access to the wet dock complex is 95m long, 16m wide, and has a depth of 6m over the sill. The basins in the complex provide 1,100m of total berthage and can accommodate vessels up to 3,000 dwt and 5.5m draft.

The main riverside quays provide about 1,800m of total berthage with depths of 10.4 to 12.5m alongside. There are facilities for tanker, bulk, and container vessels. Vessels up to 270m in length and 11.3m draft can be handled at HW.

Caution.—Anchoring and fishing are prohibited within an area, the limits of which are shown on the chart, along the W side of the river adjacent to Brake.

8.33 The **Hunte River (**53˚15'N., 8˚29'E.) is entered 4.5 miles above Brake and leads to the small ports of Elsfleth and Oldenburg, lying 2 and 14 miles, respectively, above its entrance. The river fairway is about 130m wide at the entrance, 95m wide at Elsfleth, and only 25m wide at Oldenburg.

A flood barrage is situated 0.5 mile within the mouth of the river and is closed when the water level rises to 0.8m or more above MHW. The barrage provides two passages, each with a navigable width of 25.8m.

Four bridges span the river between the entrance and Oldenburg. The limiting width of the navigable passages is 19.3m and the limiting vertical clearance is 26.9m. In addition, several overhead cables span the river and have a minimum vertical clearance of 26 m.

A speed limit of 5.4 knots is in force within the river.

The fairway has a projected dredged depth of 3.8m as far as the flood barrage. Above the barrage, the fairway has a projected dredged depth of 3.9m extending to close above Elsfleth and 2.3m as far as Oldenburg.

Elsfleth (53˚14'N., 8˚28'E.) (World Port Index No. 30860) consists of several riverside facilities. A prominent nautical school, with a mast, stands in the vicinity of the small town. The port provides 480m of total quayage with depth of 3 to 4.9m alongside. Vessels up to 2,700 dwt, 90m in length, and 5m draft can be accommodated at HW.

Oldenburg (53˚07'N., 8˚13'E.) (World Port Index No. 30870) is the terminus of the Hunte-Ems Kanal (Der Kustenkanal). The harbor provides about 1,900m of total riverside berthage with a depth of 3m alongside. There are facilities for general cargo, bulk, tanker, and LPG vessels. Vessels up to

1,500 dwt, 85m in length, 10m beam, and 4m draft can be accommodated at HW.

8.34 Close above the junction with the Hunte River, the River Weser narrows to a width of about 150m. A power station is situated at Farge (53˚12'N., 8˚31'E.), on the E bank of the Weser, 3 miles above this junction. It is fronted by a quay, 550m long, with depths of 7 to 9.7m alongside. Vessels up to 200m in length, 25m beam, and 9m draft can be accommodated alongside.

Between Farge and Vegesack, a distance of 4 miles, the channel gradually narrows. Several shipyards, fitting-out berths, dry docks, and floating docks are situated along the banks of the river and there are numerous industrial plants fronted by small quays, with depths of 2.6 to 5.5m alongside.

The largest dry dock is situated in Bremer Vulcan Shipyard at Vegesack. It is 331.5m long, 57.3m wide, and can handle vessels with drafts up to 8.18m.

Tides—Currents.—Close above Vegesack, the incoming current sets for only about 2 hours 45 minutes. It begins at 3 hours before HW at Bremerhaven and lasts until 15 minutes after HW with a maximum rate of 1 knot. After a period of slack water, lasting 40 minutes, the outgoing current begins and lasts for about 9 hours with a maximum rate of 2 knots.

Bremen (53˚08'N., 8˚46'E.)

World Port Index No. 30900

8.35 The port of Bremen is situated along both banks of the Weser, 36 miles above Bremerhaven. In addition to its extensive cargo handling facilities, it is also a large shipbuilding center. The harbor encompasses the river area between Mittelsburen and Grossen Weserbrucke, a distance of 5.5 miles, and consists of three parts.

A large wet dock complex, entered through a lock at the NE side of the river, forms the central part of the harbor. Several tidal river berths, along with a number of oil and ore installations, occupy about 1.5 miles of the river below the entrance to the wet dock and form the outer part of the harbor. Several large tidal basins, situated above the entrance to the wet dock, form the inner part of the harbor.

Tides—Currents.—The tides rise about 4.1m at springs and 3.6m at neaps.

Winds from the S quadrant tend to lower the water level.

On the S side of the channel off the entrance to the lock, the incoming current begins about 5 hours before HW at Bremen and flows for 1 hour 45 minutes, attaining a maximum rate of 0.5 knot. After a period of slack water, lasting for 2 hours 15 minutes, the outgoing current begins about 1 hour before HW and lasts for 8 hours 30 minutes, attaining a maximum rate of 1.5 knots.

Depths—Limitations.—The main river fairway leading to Bremen has a projected dredged depth of 9m.

Oslebshausen Schleuse, a lock, provides access to Industriehafen, the wet dock complex. It is 248m long and 34.1m wide, with a depth of 7.8m over the sill.

The main riverside facilities of the outer harbor include Klocknerport Ore Terminal Quay, 300m long, and Frisia Oil Terminal Quay, 265m long, both of which have depths up to 11.5m alongside and can accommodate vessels up to 250m in length and 10.7m draft at HW.

The complex, which forms the central part of the harbor, consists of the following main basins:

1. Olhafen, which has 190m of berthage, with depths of 5 to 9.7m alongside.
2. Huttenhafen, which has 960m of berthage, with depths of 8 to 10.2m alongside.
3. Kalihafen, which has 500m of berthage, with depths of 9.8 to 10.2m alongside.
4. Kohlenhafen, which has 900m of berthage, with depths of 9.8 to 10.2m alongside.
5. Hafen E, which has 450m of berthage, with depths of 8.8 to 10.2m alongside.
6. Hafen F, which has 280m of berthage, with depths of 5 to 9.7m alongside.
7. Hafen A, which has 550m of berthage, with depths of 8.6 to 10.2m alongside.

The inner harbor consists of the following principal tidal basins:

1. Kap Horn Hafen, which has 250m of berthage, with a depth of 9m alongside.
2. Werfthafen, which has 1,360m of berthage, with a depth of 7.2m alongside.
3. Getriedehafen, which has 725m of berthage, with a depth of 11.5m alongside.
4. Holz und Fabrikenhafen, which has 2,280m of berthage, with a depth of 10.5m alongside.
5. Europahafen, which has 2,690m of berthage, with a depth of 8.5m alongside.
6. Neustadterhafen, which has 2,600m of berthage, with depths of 10.5 to 11.5m alongside.

There are facilities for general cargo, bulk, tanker, ro-ro, container, passenger, car carriers, reefer, and LASH vessels within the port.

Vessels up to 230m in length, 32.3m beam, and 9.4m draft can enter the wet dock complex at HW. Vessels up to 250m in length and 10.7m draft can be accommodated in the port.

Regulations.—Vessels over 220m and over 50m in lengths may not meet between the entrances to Neustadterhafen and Europahafen.

Before taking a berth in a basin, vessels must be turned with bows towards the entrance, unless special permission to act otherwise has been authorized by the harbormaster.

At times, both lock gates are opened for the purpose of equalizing the water level in the wet dock complex with that in the river. At such times, vessels must only enter or depart against the current and with the assistance of a tug or tugs.